The Antiquary.

AUGUST, 1897.

Notes of the Month.

THE Diamond Jubilee celebrations have interrupted a good deal of the routine of work in archæological matters as in the wider sphere of everyday life, and for that reason, perhaps, it is that we have rather less to record in these notes than usual. One feature of the celebration has been a retrospect made in most matters, of their condition at the present day as contrasted with that at the time when the Queen ascended the throne, sixty years ago. The study of archæology can show in this as good a record of progress as anything. What sixty years ago was little more than a hobby indulged in by a few persons, has now taken its place as an exact science, and its work, which was formerly only too truly parodied by the celebrated Pickwickian discovery of the Bill Stumps stone, has in our day been systematized, and made to yield results in the history of the human race quite undreamt of only a few years ago. We have no intention of following this line of thought further on the present occasion, interesting as it might be to do so, but we may point out that while at the present day nearly every county has its local society of archæology, the only provincial society existing when the Queen came to the throne was the Newcastle Society of Antiquaries, which the presence of the Roman Wall had almost forced into existence at an earlier period. With that notable exception, the only archæological society in the country was in 1837, we believe, the Society of Antiquaries of London, which then met in the old and inconvenient rooms at Somerset House. We have but to compare the state of things then existing with the present day to note the progress which has been made.

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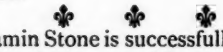
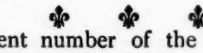
By an oversight we omitted to mention in these notes for July that at the meeting of the Society of Antiquaries held on June 3, the chair was at first taken by the secretary, Mr. C. H. Read, who announced the election by the Council of Lord Dillon as president of the society in the room of Sir A. W. Franks. Lord Dillon having been introduced, and having taken the chair, which was vacated by the secretary, the latter, on behalf of the society, congratulated the new president on the honour conferred upon him. The following resolution passed by the Council was communicated to the meeting: "The Council of the Society of Antiquaries desires to record its sense of the irreparable loss which not only the society, but all those interested in the study of archæology, literature, and science have sustained by the death of Sir Augustus Wollaston Franks, President of the Society of Antiquaries of London, which occurred on May 21 last, and during his tenure of that office. In recording this, the Council has not only to deplore the loss of a most learned, liberal, and distinguished president, but of one who, by his amiability and sympathetic courtesy, endeared himself to all with whom he was brought into association." Sir J. C. Robinson then moved, and Mr. C. Knight Watson seconded, the following resolution, which met with the unanimous approval of the meeting: "While concurring with the Council in the resolution which has been read, this meeting cannot refrain from bearing independent testimony to the great eminence and the personal worth of its late president, and from offering to his family the assurance of its profound sympathy." A motion expressive of regret at the retirement of Dr. Freshfield, and acknowledging his work on behalf of the society for the last twenty-three years, was also passed. The following gentlemen were at the same meeting elected Fellows of the Society: Messrs. F. P. Barnard, R. Burnard, H. F. Cook, A. R. O. Stutfield, A. Prevost, H. Y. Thompson, and E. P. Warren, the Rev. J. Frome Wilkinson, and Col. J. H. Rivett-Carnac.

An element of painful interest attaches itself to the Illustrated Catalogue recently issued of the Heraldic Exhibition of 1894, in the death of the late President of the Society of Antiquaries, to whom much of the success of the exhibition was due. The Catalogue, which has been issued by the Society to subscribers, has been admirably edited by Mr. W. H. St. John Hope, while the illustrations are what might be expected when it is said that the production of the plates is the work of Mr. Griggs. There are fifty plates, several of which are in colour. Among the more important objects figured are the helm, crest, and gauntlets from the tomb of the Black Prince, as well as his shield and jupon; an enamelled coffer at South Kensington; the royal banner of Scotland carried at the battle of Worcester, 1651; three coloured plates of mounted figures, and one of Henry VIII.'s Badge from the Westminster Tournament Roll; a number of beautifully coloured plates of Royal Badges from manuscripts at the Heralds' College; and several facsimiles of book-plates, including that of Maurice Johnson, F.S.A., 1735, showing the original sketch and the second state of Vertue's engraving. It is not often that an archæological work is such a comely one to look upon as this is, and very great credit is due to the Society of Antiquaries for it, and to all concerned in its production.



Sir Benjamin Stone is successfully prosecuting the National Photographic Record scheme, and at a meeting on the subject held at the Midland Grand Hotel, London, on July 8, an important step in advance was made. Representatives were present of the Royal Society, the Society of Antiquaries, the Royal Photographic Society, the Royal Geographical Society, the Royal Archæological Institute, the Royal Institute of British Architects, and other societies. Sir Benjamin Stone remarked that the word-description was rapidly giving way to pictorial illustration, and photography had brought to our aid a more graphic, and accurate form of pictorial record than that of the most valuable ancient drawing. The trustees of the British Museum fully agreed with him that photographic records for the instruction of present and future generations could not fail to be of the greatest value and interest, and had expressed their willingness to take charge of the proposed collection. Lord Rosse, Captain Abney, and Mr. W. H. St. John Hope spoke in favour of the scheme, and eventually a committee composed of the following was appointed to form a National Photographic Record Association: The Earl of Crawford and Balcarres, Sir Edward Thompson, Sir Benjamin Stone, Professor Meldola, Captain Abney, Dr. Mill, and Messrs. W. H. St. John Hope, Alexander Graham, Philip Norman, W. W. Watts, Fagan, Lawrence, and Robinson. We hope, as we have said on previous occasions, that the scheme will not merely include the photographing of buildings and objects, but the collecting (for careful preservation) of existing photographs of buildings. Many old photographs give a good idea of buildings now destroyed or altered, and form a most valuable record. For instance, in the present number of the *Antiquary* we reproduce an old photograph, taken *circa* 1870, of the demolished church of St. Crux at York. Many other old photographs are yet extant of other ancient buildings no longer in existence, and they should be collected and carefully preserved. We earnestly hope that the National Photographic Record Association will include such collecting and preservation of old photographs as part of its work. In a few years it will be too late to do so. The importance of this feature of the work is liable to be overlooked in the arrangements made for taking photographs on an uniform scheme, but it is a most important matter, and we feel that it cannot be pressed too strongly.



In a recent number of the *Antiquary* we deplored the fact that the Associated Societies (as they are generally called), which in the past have done much excellent and useful work, appeared to be more or less in a moribund condition. We note, therefore, with pleasure that the Lincolnshire and Nottinghamshire Archæological and Architectural Society (which is one of the group) has been holding a very successful two days' meeting, and that it shows other signs of renewed vigour. We hope that this may be accepted as a favourable omen for the future work of the Society. We would suggest whether it might not be well to drop the Nottingham-

shire element, now that a separate society has been founded for that county, and so confine the work of the old society to Lincolnshire, which is by itself quite large enough to occupy the labours of a separate society.

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The Yorkshire East Riding Antiquarian Society is one of the youngest of the provincial societies, but it is doing some excellent work, and thanks to the fact that two of its members are Mr. T. Boynton and Mr. J. R. Mortimer, it has recently engaged in the important work of exploring the mounds which are of such frequent occurrence in the south-east of Yorkshire. Lately, Mr. Mortimer and Mr. Boynton have been at work at Kilham, near Duffield, where there are several tumuli known as the "Danes' Graves." These have been opened, and some notable discoveries made, which were the subject of discussion at a recent visit of the members of the Society to Kilham. The mounds have been popularly supposed to be the last resting-places of Danish settlers, but Canon Greenwell pointed out that this theory is no longer tenable. He was led to this opinion by an iron bracelet in the Ashmolean Museum, Oxford, which was found in one of the graves at Kilham. This was emphatically an armlet of the Early Iron period. Now all doubts have been put at rest, as Mr. Mortimer had found a very beautiful bronze pin, enamelled. It was a specimen of Early British enamelling, and a type quite peculiar to the Early Iron period. Its peculiar twist in the shank made its identity quite conclusive; but there was more conclusive evidence still. In the graves had been found the remains of a chariot—an important element in British warfare. In two other graves, the one at Arras in the north of France, and the other at Beverley, chariots had been found, and in that found at Arras there were tyres and naves of the wheels complete. The tyres were of iron, but the naves were of bronze. There was an iron mirror with bronze mountings, and, curiously enough, the person buried was a woman, who was, no doubt, a great lady. There was also the bronze shank end of the whip, and two or three rings through which the reins of the chariot had been carried. No traces, however, were found of bells or accessories at Beverley; but at Arras human bones and pigs' bones were found just as fresh as if they had only been buried a hundred years. There was no trace of the horses except the bits, and therefore the warrior must have been buried with the chariot and his horses, represented by the wheels and the bits, similarly as in the grave at Kilham.

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We are so richly endowed with historical buildings in this country, that we scarcely do more than note it as a passing event, when some old parish church falls a victim to the flames. In America, where nothing is old except the land itself, every building with the least trace of historical association is valued in a manner quite impossible in the mother-country. We learn, therefore, with much regret, that the State of Georgia has lost in Christ Church, Savannah, a building of many treasured memories and historical associations. The church was, unfortunately, burnt to the ground on May 23. The parish was founded soon after the settlement of Savannah, and claimed John Wesley as its rector in the earlier days of his ministry, in what was then an English colony. The first church building was begun in 1743, but was not completed till 1750. In 1796 it was greatly injured by fire, and was pretty well rebuilt in 1803. The next year it was partially destroyed by a hurricane, and it was not restored till 1810. The building survived the perils of the late Civil War. Not long ago it was greatly beautified within, a handsome altar and a new organ being added. It is thought the walls can be used again. The church is said to have contained all the records of Savannah, and particularly of the State of Georgia, since 1825, most of which are totally lost; this, it may be hoped, is incorrect.

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The great book sale of the season, that of the Ashburnham Library, at Messrs. Sotheby's, has resulted in record prices for some of the works from the presses of the early printers. As was to be expected, the highest price was obtained for the Gutenberg, or "42-line" Bible, generally regarded as the first printed book, and of which only about thirty copies are known to exist. The bidding for this copy started at £500, and quickly ran up to £4,000, at which price it was knocked down to Mr. Quaritch. The "Biblia Pauperum," an original block-book, realised £1,050; the

"Biblia Latina" (1462), £1,500. It may be remembered that a copy of the Gutenberg Bible was sold in 1884 for £3,900, the highest price except one ever paid at auction for a printed book, the exception being a copy of the *Mentz Psalter* of 1457 (the earliest book with a printed date), for which £4,950 was given by Mr. Quaritch at the same sale. It is expected that another copy of the Gutenberg Bible, that which belonged to the late Rev. Mr. Mackellar, will shortly come into the market.

In the Notes of the Month for July we observed that the replacing of the old market crosses in Scotland is becoming quite a common feature of the time. We then recorded a project for replacing the cross at Wemyss. We now learn that a similar movement is in progress at Hawick, where, at a recent meeting of Hawick Town Council, the proposal was made by the Hawick Archæological Society that the old market cross, of which the base only is left, should be restored by the Council. The latter thought the Society should take the matter up, but they continued the question for further consideration. In this instance the question seems to be, not as to replacing the cross in its proper position, but the adding of a new shaft and cross to the existing base. This is a matter rather more open to debate than the re erection of a cross which had been improperly taken down. The proposal of the Hawick Archæological Society savours too much of "restoration" to commend itself to the judgment of antiquaries generally. If a cross is needed, let it be a new one altogether.

A very common story prevalent in various parts of the country is to the effect that salmon was formerly so plentiful that servants and apprentices bargained, on entering service, that they should not have to eat salmon oftener than a certain specified number of times in the week. The tradition is common almost everywhere in the neighbourhood of salmon rivers. It prevails in Scotland as well as in England, and we believe in Norway and Sweden also. Dr. Brushfield has contributed a paper on the subject to the current number of the *Journal* of the Chester Archæological Society, in which he goes very carefully into the matter as regards the indentures of apprentices. The result is definitely in the negative, for not a trace can be found of anything by way of support of the legend. This almost relegates the matter to the region of folk-lore; but we cannot think that a story so possible, if not probable, can have had no origin in fact. Coupling the theory that leprosy originates from a fish diet with the undoubted abundance of salmon in the past, it seems quite likely that the legend had its origin in a prejudice against salmon at some former period during the Middle Ages. Dr. Brushfield's painstaking researches are conclusive so far as they go, but the dates need to be pushed further back, and that, from the nature of the case, is almost impossible. No early indentures of apprentices are to be looked for, and evidence from that source is therefore wanting.

The necessity which exists for some system of protecting national antiquities is constantly receiving fresh illustration from various quarters. Quite recently a correspondent of the *Times* has called attention to the threatened demolition of a Roman camp near London. Mr. F. A. Edwards, the correspondent alluded to, writes to the *Times* as follows: "Probably there are few, even amongst archæologists, who are aware that there are within seven miles of the Bank of England the well-defined remains of a Roman camp. This camp is situated on Uphall Farm, on the eastern bank of the River Roding, between Ilford and Barking, and is of the usual four-square shape, on a slight elevation above what was formerly marshy ground. The vallum, though much reduced by centuries of agricultural operations, is still recognisable on all four sides, whilst on the river side there is a higher elevation, evidently for look-out purposes. Now this relic of the past is threatened with extinction by the irrepressible builder, the farm being advertised for sale next Friday [July 9] as building land." Mr. Edwards adds: "Cannot the destruction of this antiquity of some fifteen centuries be prevented? If the area could be dedicated to public purposes and the enclosure turned into a garden or even cricket-field it would be of lasting benefit to the fast-growing population of this district. Once destroyed it can never be replaced." It is to be hoped that, attention

having been called to the matter, something may be done to preserve the camp.

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In a paper on the "Antiquity of Place-names," contributed to the Chester Archæological Society's *Journal*, Mr. Haverfield asks for an Historical Dictionary of Topography, as one of the principal things which the student of early Britain (British, Roman, or Saxon) needs at the present time. There can be no doubt as to the urgent need of a dictionary of the kind. Mr. Haverfield suggests that as archæological surveys of counties are in active preparation on many sides, each county society should endeavour to compile a list of the place-names, with a careful statement of their oldest ascertainable forms, their proper uses, and other such information. The suggestion is much to the point, and we hope it will receive attention on the part of those engaged in the archæological survey work. Mr. Haverfield's proposal originated in the difficulties arising from the significance and age of the name "Watling Street." This, however, is only one instance, though an important one, in which careful local inquiry is needed, the results of which would be incorporated in the dictionary. A dictionary dealing, in the manner indicated, with place-names has long been wanted, and we trust may soon be taken in hand. If one county society would lead the way, others would soon follow. Perhaps Chancellor Ferguson, who has set so many things going, will make a start in this.

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The excavations at Mount Grace, to which we have alluded on former occasions, were resumed at Whitsuntide by Mr. W. H. St. John Hope, on behalf of the Yorkshire Archæological Society. Portions of the foundations of conventual buildings to the west of the church were uncovered. These showed a somewhat complicated arrangement of buildings, the exact arrangements and uses of which are not at present ascertained. We hope to allude more at length to the work in progress at Mount Grace in an early number. The importance of the work is very great, for not merely is Mount Grace the only English Carthusian house of which any considerable remains are still standing, but it would seem that on the Continent most of the Carthusian priories have been rebuilt, and the original mediæval buildings, in almost every instance, destroyed. It is, we believe, in contemplation to endeavour to raise a national fund towards the thorough and complete investigation of Mount Grace. Meanwhile, we hope that antiquaries will respond liberally to the appeal which the Yorkshire Archæological Society has issued for contributions towards the Mount Grace excavation fund, which may be sent to the treasurer of the Society, Mr. H. S. Childe, St. John's Villa, Wakefield.

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The whole of Mr. Seton-Karr's collection of flint implements, which he obtained *in situ* in a quarry in Egypt, has just been acquired by the Liverpool Museum. The collection is unique of its kind, and possesses extraordinary interest from an ethnological point of view. We understand that the collection will be examined and described by Dr. H. O. Forbes, the director of the Liverpool Museums, who is to be congratulated on the successful result of his negotiations for the purchase of the collection in question.

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Our readers may be grateful to us if we draw their attention to an article which appeared in the *Times* of June 24, describing the remarkable discoveries which are being made by the American expedition under Mr. Haynes, who has had the good fortune, in excavating the great mounds of Nuffar in Northern Babylonia, to have unearthed the ruins of a city the foundations of which, it is believed, must have been laid six or seven thousand years before the Christian era. Probably there are many English antiquaries who know little of this expedition which, since 1888, has been so quietly working that, except among Assyriologists, its very existence has scarcely been known in this country. The most remarkable and astounding results have been achieved, and reflect the greatest possible honour on those who have been so quietly and unobtrusively at work. We hope that the paper in the *Times* will do something towards making them and their work better known in England for the future.

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We deeply regret to announce the death of our contributor, Mr. Dottin Alleyne Walter, which took place on July 14 at Dublin, after

an operation for an internal disorder. Mr. Walter, who formerly lived in Yorkshire, at Hull and at York, was an architect by profession, and came of an old family connected with Essex, where his grandfather was Rector of Leigh for many years. His father, Lieutenant George Walter, R.M., was managing-director of the old "London and Greenwich" Railway. He originated the *Railway Magazine*, which still exists as the well-known *Herapath's Journal*, and was also the inventor of what has since become a well-recognised article of commerce, and known as "Kamptulicon" floor-cloth. Mr. D. A. Walter possessed a very considerable knowledge of certain branches of archæology, such as heraldry and ecclesiology, but he could seldom be prevailed upon to do himself justice by exhibiting his knowledge of these subjects to advantage. Some years back Mr. Walter published a useful *Guide to the Ancient Churches of York*, and at a later period a work giving an illustrated account of the ancient grave-slabs in the York churches, both of which have been long out of print. Since then he has contributed many articles to our own pages, as well as to those of our contemporaries the *Builder*, the *Reliquary*, and other publications. In the present number of the *Antiquary* appears the last of three papers of Mr. Walter's notes on the demolished churches of York. Owing to his last illness, Mr. Walter was unable to revise the proofs. This the editor has had to do to the best of his ability, and any shortcomings must be pardoned in consequence.

Quarterly Notes on Roman Britain.

By F. Haverfield, M.A., F.S.A.

XXII.

A CONSIDERABLE number of discoveries has been made since my last article on Roman Remains in our islands. These discoveries all belong to places already known as Roman sites, but that is only what must be expected at the present time; several of the places to be noticed below are sites from which few discoveries have been recorded.

South and South-east.—In the south of England, Dorsetshire, Hampshire, and Sussex contribute items. At Dorchester Mr. H. J. Moule tells me that a curious quernstone has been found, but I must leave the explanation of it to persons who are better mechanicians than myself. In the same town another tesselated pavement, rather roughly made, has been uncovered; it appears to have been a corridor. I may perhaps suggest in this connection to the Dorchester antiquaries that it would be well worth while to note all such discoveries down on a large map, for instance on the twenty-five inch Ordnance map of the town, on which every pavement could be laid down to scale. It is not impossible that the conspectus thus obtained would clear our ideas as to what sort of town Roman Dorchester was in detail. Another Dorsetshire discovery may be worth notice; it is a denarius of Republican date, and of the Claudian (Clodian) *gens*. Such early coins are not unfrequently found in England, and especially in the south of it, as I pointed out in *Archæologia* some little time ago. They are relics, doubtless, of the increasing intercourse between Britain and the Roman world during the hundred years which elapsed between the two raids of Julius Cæsar and the definite invasion of the island by Claudius in A.D. 43.

At Winchester foundations have been discovered "in a field on the east side of High Street," according to a notice in the *Builder*. There is no field within some little distance of the east side of High Street, but the finds, doubtless, belong to some part of the ancient Venta Belgarum. More serious work has been done at Silchester in the neighbourhood of the south gate, and abundance of foundations have been unearthed, with some rather complicated hypocausts. I may perhaps take this opportunity of suggesting that the letters HERM on some of the staves of the tub found in 1896 denote pretty obviously the owner's or maker's name, and form the first part of some such name as Hermagoras or Hermotimus.

In Sussex I am able, by the kindness of Mr. C. T. Phillips, until lately Hon. Curator to the Sussex Archæological Society, to

record the find of some urns, including a bit of a Samian "patera," with bones, dug up by a man searching for flints on a bank between Hangleton Church and the Dyke. The discovery was made two years ago, but has not been recorded in print. Mr. Phillips has deposited in the Lewes Museum such of the objects as survive.

In London, excavations for building in Queen Victoria Street, near the corner of Walbrook, have resulted in the discovery, 26 feet below the surface, of a small vase, a bronze balance, and an iron nail, 12½ inches long. These objects are now in the Guildhall Museum.

A more important discovery has been made at West Mersea in Essex, close to the church. It has been known for at least a hundred and fifty years that there was a Roman villa on this spot, which is a short distance by water from the Roman fort at Bradwell. The new discovery, for which archæologists are indebted to Mr. W. J. Bean, of West Mersea, includes a circular brick building 70 feet in internal diameter, with internal buttresses which were continued towards the centre of the circle, and there enclosed a hexagonal space some 5 feet in diameter. Nothing was found to explain the use or date of this puzzling structure. The accounts which have reached me do not enter into sufficient detail to enable me to suggest that it was a circular sepulchral structure.

WEST AND SOUTH-WEST.—At Bath a tesselated pavement with a key-border has been found 10 feet below the surface under the site of the Weymouth House (Church) schools and near the Abbey, not very far, that is, from the great baths. At Gloucester some more of the Roman City Wall has been laid bare for a distance of about 150 feet in the Brunswick road, in the course of excavations for new buildings of the School of Science. The wall comprises four courses of Cotswold oolite in large blocks. One would much like to know the date of this wall. Glevum became a Roman "colonia" about A.D. 95, but there is very little evidence to show how far it had been previously occupied by Romans. It has been asserted that it was a fortress of the Second Legion before the establishment of Isca Silurum, but there is no proof of that.

Further west, at Carmarthen, foundations of a Roman building have been discovered on the esplanade near Dyffryn House. So far as I can judge from an account given me by the Rev. C. Chidlow, of Caio, the remains may be part of a bath. Some more of the same or of a contiguous Roman house are said to have been discovered when Dyffryn House was built. With the foundations emerged a coin, probably of Constantius Chlorus. Carmarthen has, of course, often yielded Roman remains to the archæologist, and among them an inscription which may be about as old as the coin just discovered. Its Roman name (Maridūnum) occurs on a milestone of the age of Diocletian found near Neath.

MIDLANDS.—The only discovery reported from the Midlands proper is that of two kilns with pottery of a dark-blue slate colour at Caldecote Quarries, close to Manceter, in Warwickshire, on the line of Watling Street. Manceter, as its name suggests, is the successor of the Romano-British Manduessedum, and Roman remains have not unfrequently been found at it. Four years ago a kiln was found close to the site of those found last April.

At Lincoln more columns were found in March. They are continuous with those found before in Bailgate, and close to the columns a fine tesselated pavement, a red square on a white ground, with more white inside the red square, and a head. I understand that archæologists are indebted to Mr. George Allis for the discovery, and that the pavement has been taken up and placed in the museum at the Science and Art School.

A somewhat similar discovery has been made at Chester, where part of a column 3 feet in diameter, resting on a base 4½ feet square, has been found in excavating for a new building in Shoemakers' Road, Northgate Street. No evidence appears to be available as to the building to which this considerable relic belonged. It is said to stand on solid rock only 2 feet below the present surface level.

NORTH.—In the north the principal discovery has been that of an inscription at Chesters (Cilurnum), *Aqua adducta alae ii Astur(um) sub Ulp(io) Marcello, leg(ato) Aug(usti) pr(o) pr(aetore)*, that is, A supply

of water was laid on for the garrison of the fort, an *ala* of Astures, while Ulpius Marcellus was Governor of Britain somewhere (I think) about A.D. 160-170. The stone was found in the north-east corner of the fort, where excavations are at present proceeding. At Great Chesters (Æsica), another fort on the wall further west, the Newcastle Society of Antiquaries has just recommenced excavations as I go to press. In Cumberland this summer's campaign will be opened in August.

A fragment of inscription was found lately near Brampton, on the south side of the Old Church Lane (which is now being widened), a little west of Park Head. Roman remains are said to have been found on the spot, but there appears to be no reason to consider the new find as Roman; it is a good deal later. The lettering is

REX FORTIBVS
IDEM ✱ MVRV

I am indebted for a knowledge of it to Chancellor Ferguson, who takes the same view of the inscription as I do.

LITERATURE.—Mr. Payne has published in the *Archæologia Cantiana* a good account of the Darenth Villa. I may here add to it a bit of inscribed pottery found in the recent excavations there which has been shown me. It appears to read S IIVIOL, and is imperfect at both ends. I do not know if more pieces of the urn were discovered.

Christ Church,
July 10, 1897.

On Three Ancient Churches at York, recently Demolished.

By D. ALLEYNE WALTER.*

III. ST. CRUX.

THE loss which is most deeply to be deplored of any of the destroyed churches is that of St. Crux, which from its size and architectural excellence and importance was a conspicuous object in the city. On its site, and constructed out of a portion of its stones, a miserable "parish room" has been erected. In this the monumental brasses and armorial hatchments have been placed. As, however, the Sunday-school is held in the building, they are in anything but a safe position. Some of the hatchments are of a rather earlier date than usual, and of considerable interest. The brasses on the floor are subjected to the wear and tear of the school forms placed upon them, as well as to the rough usage of the scholars' feet.

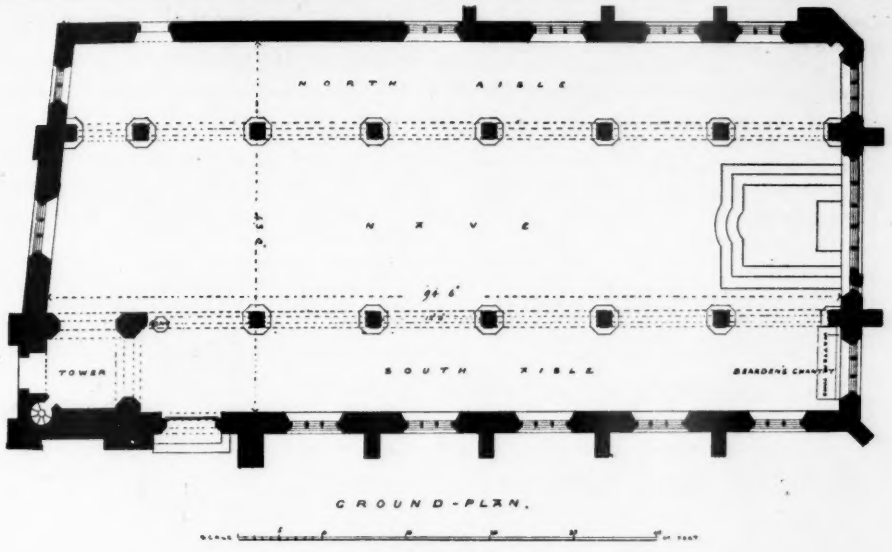
There was absolutely no excuse for pulling the church down. The churches of St. Maurice and St. Lawrence were small and unpretending buildings, and they thus afforded a specious plea to the destroyer of the want of proper church accommodation. This, however, was in no sense the case with St. Crux, which was a large building, and was undoubtedly the finest of the York city churches. The late Sir Gilbert Scott, remarking upon it, said that it was "an excellent specimen of what a city church should be." It was well lighted from the clerestory windows, and was also lofty and spacious.

The church was rebuilt in the fifteenth century, for on September 6, 1424, a commission was directed to the Bishop of Dromore to consecrate it. The style throughout was Perpendicular, and the rebuilding of 1424 seems to have been general. There were no visible traces of an earlier church. The length from east to west was 93 feet, and the width across nave and aisles 43 feet. The plan consisted of a nave of seven bays, north and south aisles, extending the whole length of the church, and a tower at the south-west angle.

The windows of the aisles were pointed, of four lights, and filled with tracery. Those of the clerestory were four centred, and of the same number of lights. The east window was pointed, of six lights, and filled with tracery of elegant character. The height was divided by a transom and lower lights, and on each side of this window were two pointed doorways originally opening to a sacristy behind. The parapets were plain, and the buttresses of three stages with set-offs.

The doorway at the west end of the south aisle was very noticeable. It had a pointed

* As mentioned in the "Notes of the Month," Mr. Walter died while this paper was passing through the press, and without being able to revise it. This the editor has done to the best of his ability.



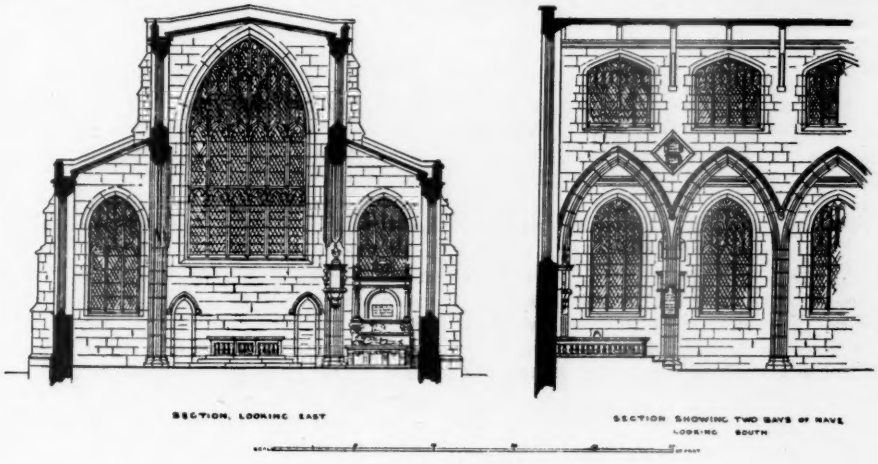
GROUND-PLAN.

ST. CRUX, YORK.

head, was well moulded, and with a drip-stone over it. The door itself was divided into six panels, with elaborate tracery in the head.

The original tower had been destroyed, and was replaced by one of red brick, with a cupola on the top; but in spite of the incongruity of the styles, it had a not unpleasing appearance. This tower was built in 1697, but was subsequently cut down to the height of the aisle roofs in 1872. The general appearance of the whole building may be seen from the photograph, which gives the view as it existed prior to 1872.

The effect of the interior was very good. The arches dividing the nave from the aisles were acutely pointed, having hood moulds over them. The rich arch mouldings were carried down the piers, and inter-penetrated



SECTION, LOOKING EAST

SECTION SHOWING TWO BAYS OF NAVE LOOKING SOUTH

ST. CRUX, YORK.

with them. Attached to one of the piers on the south-east of the nave was a particularly elegant niche. The roofs were ancient; that of the nave was very flat in pitch, those of the aisles being lean-to, and more acute. Both were divided into panels with pateræ at the intersection of the ribs. There were a few fragments of stained glass in the tracery of the east window.

ST. CRUX, YORK. (*Circa* 1870.)
(*From the south-west.*)

The furniture of the church was of the ordinary type, but there was a very fine specimen of a mediæval lectern of wood, which is now preserved in the church of All Saints Pavement.

A catalogue of the rectors is printed in Drake's *Eboracum*, where he also gives a list of the monuments and inscriptions. Amongst those interred in the church was Henry, Earl of Northumberland, who was beheaded in the adjoining street in 1572. Sir Thomas Herbert, the celebrated traveller, was also laid here. The tomb of Sir Robert Walter, Knight, who died in 1610, has fortunately been preserved.

The church was valued in Pope Nicholas's taxation at £5, and in the King's Books at £6 16s. 8d. In 1818 it was certified to be worth £104 per annum.

The living is a discharged rectory, and is now annexed to those of All Saints Pavement and St. Peter the Little. The latter church having been demolished at the Reformation, All Saints Church serves for the united parishes; but it only affords accommodation for 400 of the 1,470 parishioners of the united parishes, showing how utterly mistaken was the destruction of St. Crux, when viewed from a practical standpoint alone.

Some Mediæval Mechanicians.

By SIDNEY H. HOLLANDS.

IT is purposed herein to deal only with those old and memorable mechanicians and their doings whose times were anterior to what may be called the eighteenth-century school of engineering, this latter comprising such names as Trevithick, Stephenson, Symington, Smeaton, Newcomen, Watt, Bramah, Murdoch, Davy, Bell, Brindley, etc.

Obviously the ancient mechanicians were at a great disadvantage as compared with modern engineers, or even with those of the eighteenth and early nineteenth centuries who have had the advantage of much valuable precedent experience, thus beginning where the pioneers left off.

The period dealt with, while being bounded by the eighteenth century on the hither or later side, will extend back to and include the thirteenth century as the limit of antiquity for present purposes.

In the year 1214, then, near the little town of Ilchester, in Somersetshire, was born in the troublous reign of Henry III. the illustrious Roger Bacon, "Friar Bacon" as he is often called, in allusion to his having entered a monastic order.

Of this extraordinary man it has been well said that "he was not appreciated by his own age, because he was so completely in advance of it." He would seemingly have been more in keeping with the times of four centuries later.

Entering at Oxford University (in about

the year 1230)—then of very limited extent—and assimilating good store of theological and classical knowledge, he afterwards travelled to France, and studied for some time at the University of Paris, then the intellectual centre of Europe, there acquiring an excellent scientific and philosophical training. Returning to Oxford in about the year 1250, he entered the Franciscan Order of Friars at that city, and was even then much suspected of dealings in magic and the "black art."

Roger Bacon's fame in popular estimation has always rested on his mechanical inventions and discoveries, although he was really much greater as a philosophical and theological writer than as a mechanician.

Exceedingly numerous and voluminous are the MSS. he has left, many of which it is said have probably yet to be unearthed.

It is in association with the long-famed "brazen head" alone, perhaps, that Friar Bacon is known to the majority of general readers. About this same oracular "brazen head" there seems to be much that is legendary and apocryphal, based on a modest substratum of matter-of-fact.

The possibility of making a realistic artificial human head fitted with a working model, mechanically articulating, of the vocal organs, which would utter a limited vocabulary with weird and startling distinctness, has been demonstrated since Bacon's time (but before the invention of the phonograph) by Wolfgang Kemplin, originator of that famous illusion the "automaton chess-player," and since then, *i.e.*, about twenty-five years ago, the present writer remembers having seen such a "speaking head" which was then being exhibited in London.

In this case the talking mechanism—artificial larynx, tongue, palate, etc.—were operated through a keyboard resembling that of a piano of small compass, a set of valves controlling the wind-supply being also worked through the same medium.

The practicability of such a piece of mechanism having thus been proved, and Roger Bacon having shown a technical knowledge and skill very far ahead of his times, it appears that we may fairly credit him with having anticipated these later productions.

In his quaint treatise *Of Admirable Artificial Instruments*, Bacon says: "That I may the better demonstrate the inferiority and indignity of Magical power, to that of Nature and Art, I shall a while discourse on such admirable operations of Art and Nature as have not the least Magick in them; and afterwards assign their causes and Frames. And first of such Engines as are purely artificial.

"1. It's possible to make Engines to sail withall, as that either fresh or salt water vessels may be guided by the help of one man, and made sail with a greater swiftness than others will which are full of men to help them. 2. It is possible to make a chariot move with an inestimable swiftness, (such as the Corrus falcati were, wherein our forefathers of old fought,) and his motion to be without the help of any living creature. 3. It's possible to make Engines for flying, a man sitting in the midst whereof, by burning only about an Instrument which moves artificiall wings made to beat the Aire, much after the fashion of a Bird's flight. 4. It's possible to invent an Engine of a little bulk, yet of great efficacy, either to the depressing or elevation of the very greatest weight, which would be of much consequence in severall Accidents; for hereby a man may either ascend or descend any walls, delivering himself or comrads from prison, and this Engine is only three fingers high, and four broad. 5. A man may easily make an Instrument whereby one man may in despight of all opposition draw a thousand men to himself, or any other thing which is tractable. 6. A man may make an Engine whereby without any corporal danger he may walk in the bottom of the sea or other water.

"Such Engines as these were of old, and are made even in our days.

"These all of them, (excepting only that instrument of flying, which I never saw, or know of any who hath seen it, though I am exceedingly acquainted with a very prudent man, who hath invented the whole artifice,) with infinite such-like inventions, Engines and devices are feasible, as making of Bridges over Rivers without pillars or supporters."

It must be remembered that Bacon lived in an age when to avow a disbelief in magic, witchcraft, necromancy, etc., was to be

heterodox indeed, and such an avowal was fraught with considerable danger to the hardy unbeliever, while it was equally dangerous to profess the practice of these occult arts.

Roger Bacon died in the year 1292, at Oxford, in the seventy-eighth year of his age.

This article would be incomplete without at least a passing reference to one who, though obscure and comparatively unknown, was an ingenious and resourceful mechanician in the dark Middle Ages, being besides evidently one with dauntless energy and capacity for skilled and arduous work.

This man was one Peter Lightfoot, a monk of Glastonbury Abbey, in Somerset. Born towards the end of the thirteenth century, he by-and-by retired from the world into monastic seclusion, in which he would appear to have mistaken his vocation, and buried talents that would have been of value to the outside world.

In the year 1325 Peter Lightfoot devoted his leisure to the designing and construction of a great clock for the abbey. This he achieved entirely single-handed, with, it is needless to say, the crudest and most primitive appliances.

It will give an idea of the labour involved, when it is stated that the mechanism of the clock occupies a space of about 5 feet cube (125 cubic feet), that the structure is wholly of forged iron, that the numerous wrought-iron wheels, some of which are nearly 2 feet in diameter and about ½ inch thick, besides having to be made truly circular and concentric, had all their teeth cut out, and trimmed to workable shape by hand, and that the heavy wrought-iron frames, etc., are fastened entirely by means of mortise, tenon, and cotter, no screws being used in the whole structure. The pinions are of the lantern form, with octagonal cheek-plates on square spindles, and the pendulum of modern form beats seconds.

It is a curious feature in this remarkable clock that the striking movement is arranged with the axes of its wheels, etc., at right angles to those of the going mechanism; the releasing gear for striking, connecting the two systems, is original and ingenious.

This clock was going continuously and doing good service at Glastonbury Abbey for about 250 years, until about 1580, in Elizabeth's reign, when it was removed to the not-far-distant Wells Cathedral, where it continued in constant use for about 250 years more, *i.e.*, up to about fifty years ago. It was then taken down to make room for a modern clock, and stowed away in the crypt until about thirty years ago, when it was rescued from oblivion, rust and decay. Being then brought to light, it had a few minor parts restored, was re-erected at the South Kensington Museum, London, was started working again, and continues going to the present day, as though its life were interminable—surely the oldest piece of working mechanism extant.

Foremost in the ranks of mediæval mechanicians in all probability is Leonardo da Vinci. Known to the majority of moderns only as a great painter, and one of the old masters, he nevertheless was also not only a clever and clear-thinking mechanician, but an exceedingly versatile genius. It is still more remarkable that he appears to have been well versed in all the sciences and arts he pursued, being by no means the proverbial "Jack of all trades."

Born in the year 1452 at the Castle Vinci, in the valley of the Arno, young Leonardo is recorded to have had a varied youthful education, on the authority of Vasari, who says:

"In arithmetic he made such rapid progress that he often confounded the master who was teaching him by the perpetual doubts he started, and by the difficulty of the questions he proposed. He also commenced the study of music, and resolved to acquire the art of playing the lute, when, being by nature of an exalted imagination and full of the most graceful vivacity, he sang to that instrument most divinely, improvising at the same time both the verses and the music." Vasari says further: "Modelling in clay and drawing are said to have been his favourite pastimes, having regard to which his father placed him with his friend the artist Andrea del Verrocchio, to have an artistic training."

Colvin says: "Considering the range of his speculative as well as that of his practical powers, he seems certainly the man whose genius has the best right to be called universal of any that have ever lived."

In Dr. Draper's work, *The Intellectual Development of Europe*, that writer says: "Long before Bacon,* Leonardo da Vinci laid down the maxim that experience and observation must be the foundation of all reasoning in science, that experiment is the only interpreter of Nature, and is essential to the ascertainment of laws.

"Unlike Bacon,* who was ignorant of mathematics, and even disparaged them, he points out their supreme advantage.

"Seven years after the voyage of Columbus, this great man—great at once as an artist, mathematician, and engineer—gave a clear exposition of the theory of forces obliquely applied on a lever. A few years later he was well acquainted with the earth's annual motion. He knew the laws of friction subsequently demonstrated by Amontons, and the principle of virtual velocities. He described the camera obscura before Baptista Porta, and understood aërial perspective. He wrote well on fortification, anticipated Cartelli on hydraulics, occupied himself with the fall of bodies, treated of the times of descent along inclined planes and circular arcs, and of the nature of machines. He considered with singular clearness respiration and combustion."

In addition to the above, Leonardo da Vinci was a rational, practical, and accomplished worker in the field of aëronautical science (aviationist), was a skilled physiologist, and the designer of numerous very ingeniously worked-out mechanical contrivances, many for purposes of warfare, as for instance: "A device for dislodging an assailant's scaling ladders."

This consisted of horizontal bar-frames in line, which when not in use rested in a long horizontal groove high up on the face of the outer walls. Any one or more of these bars could be thrust out bodily and parallel from the wall by means of long pivoted levers worked from within, and connected to the outer bars by means of rods passing through small holes in the wall, thus overthrowing at will any ladders reared against it.

A Mangonel.—This was a formidable machine for hurling missiles, being a species of combination of the crossbow and the catapult on a colossal scale, having a massive tapered spring-beam or half-bow, having its butt-end rigidly secured into a timber frame, the spring end being deflected or strung to the firing position by means of a windlass and triple-purchase sheave-block tackle. This was made to throw two stones at once, of apparently about 20 lb. each.

Engines for discharging Missiles, of admirable efficacy and hitherto unknown.—These consisted of arrangements or multiple systems of crossbows, mechanically strung, charged and fired in due sequence. These bows were fixed radially within a wide skeleton tread-wheel of about 7 or 8 feet in diameter, which was rotated by men in the manner of a tread-mill, and the stationary axle-tree of which was provided with the necessary fittings and connections for automatically working the crossbows as they were whirled around it with the wheel, firing them in turn when they reached a position more or less elevated above the horizon. The discharging position could be varied within certain limits, both for training and elevation. The men working the machine were protected by a shield.

A Spinning Machine.—This machine has but two spindles, with the attendant gear, but displays a striking likeness to modern machinery of its class in the detail of these.

A Machine for sawing Blocks of Marble into Slabs.—This was an arrangement somewhat similar to the modern stone-mason's two-handed saw, excepting that two parallel saw-blades fixed in one frame were used, being spaced apart a distance equal to the required thickness of the stone slab. The saw-frame was reciprocated by hand between suitable guide-frames.

A Machine for cutting Files.—This bore considerable likeness to modern file-cutting and mill-stone dressing machines, the cutting or serrating tool being carried at the outer end of a vibrating lever, worked after the manner of a tilt-hammer, under which the file was fed along automatically.

Design for a Mechanical Wing.—This was an articulated skeleton wing-frame, which was flexed and relaxed by means of artificial tendons or wires attached to the underside of each of the members or joints, and converging to a spot somewhat below the root or pivot of the wing. It was intended to be covered with

* Lord Francis Bacon (born 1561), of Elizabethan celebrity, is here meant.

a membrane, and was a close imitation of the natural wing of the bat.

Leonardo da Vinci made exceedingly neat and explicit mechanical drawings of the whole of the foregoing contrivances, and these are happily extant, being preserved in the Ambrosian Library, Milan.

An exceedingly interesting letter, written by Leonardo da Vinci, is also fortunately preserved in this library.

This letter serves to give a very good idea of his accomplishments in the matter of the machinery and appliances of warfare.

The letter—written about the year 1482, when Leonardo was about thirty years of age—is addressed to Ludovico Sforza ("Il Moro"), Duke of Milan, and runs as follows:

"Having, most illustrious lord, seen and duly considered the experiments of all those who repute themselves masters in the art of inventing instruments of war, and having found that their instruments differ in no way from such as are in common use, I will endeavour, without wishing to injure anyone else, to make known to your Excellency certain secrets of my own, as briefly enumerated here below:

"1. I have a way of constructing very light bridges, most easy to carry, by which the enemy may be pursued and put to flight. Others also of a stronger kind, that resist fire or assault, and are easy to place and to remove. I know ways also for burning and destroying those of the enemy. 2. In case of investing a place, I know how to remove the water from ditches, and to make various scaling ladders, and other such instruments. 3. Item: If, on account of the height or strength of position, the place cannot be bombarded, I have a way for ruining every fortress which is not on stone foundations. 4. I can also make a kind of cannon, easy and convenient to transport, that will discharge inflammable matters, causing great injury to the enemy, and also great terror from the smoke. 5. Item: By means of narrow and winding underground passages made without noise, I can contrive a way for passing under ditches or any stream 6. Item: I can construct covered carts, secure and indestructible, bearing artillery, which, entering among the enemy, will break the strongest body of men, and which the infantry can follow without any impediment. 7. I can construct cannon, mortars, and fire-engines of beautiful and useful shapes, and differing from those in common use. 8. When the use of cannon is impracticable, I can replace them by catapults, mangonels, and engines for discharging missiles of admirable efficacy, and hitherto unknown; in short, according as the case may be, I can contrive endless means of offence. 9. And, if the fight should be at sea, I have numerous engines of the utmost activity, both for attack and defence; vessels that will resist the heaviest fire; also powders or vapours. 10. In time of peace, I believe I can equal anyone in architecture, and in constructing buildings, public or private, and in conducting water from one place to another. Then I can execute sculpture, whether in marble, bronze, or terra-cotta; also in painting, I can do as much as any other, be he whom he may. Further, I could engage to execute the bronze horse in lasting memory of your father, and of the illustrious house of Sforza; and, if any of the abovementioned things should appear impossible and impracticable to you, I offer to make trial of them in your park, or in any other place that may please your Excellency, to whom I commend myself in utmost humility."

The foregoing is as nearly a literal translation of the letter as the subject admits of.

Another biographer of Leonardo da Vinci, Mrs. Heaton, says: "This letter could only have been written by a genius or by a fool."

It is sufficiently clear to the intelligent reader that Leonardo da Vinci was no kind of fool. As a literary worker he was indefatigable, having left no less than 5,000 pages of MS.

An extraordinary, and probably unique peculiarity of these MSS., is that the greater part of them were written backwards, *i.e.*, from right to left, and with the left hand; they are, consequently, fairly difficult to read, unless placed before a mirror, when they are distinctly legible.

One of Da Vinci's best and most interesting technical works, for its sound practical treatment, is his *Treatise upon the Flight of Birds*. It may be remarked that the subject is one that none but a thoroughly practical as well as theoretical mechanician could deal with

adequately. In this Da Vinci was vastly ahead of his times.

He commenced his literary-scientific labours in about his thirty-seventh year, and carried them on almost uninteruptedly for the remaining thirty years of his life. He died in the year 1519 in France.

Dr. Jean Paul Richter, who has compiled and edited *The Literary Works of Leonardo da Vinci*, published in London in 1883, says, "There can be no doubt that in more than one department, his principles and discoveries were infinitely more in accord with the teachings of modern science than with the views of his contemporaries. . . The labours of three centuries have hardly sufficed for the elucidation of some of the problems which occupied his mighty mind."

The next following mechanician and engineer of note was also an Italian.

Augustin Ramelli was born at Masanzana, in the environs of Milan, in the year 1531.

It is recorded that he advanced rapidly in his studies, particularly in mathematics. After leaving school he entered the imperial army, and in an exceptionally short time obtained a captaincy.

Marshal de Marignan, his patron and protector, dying in 1555, Ramell travelled into France; and, going well accredited to the Duc d'Anjou (afterwards Henri III. of France), was appointed engineer to that prince. It is noteworthy that, when the Duc d'Anjou attained to the throne, he did not neglect Ramelli, but liberally provided for him. As a manifestation of gratitude Ramelli wrote and dedicated to the King the following engineering work, with a most formidable title, viz., *Le diverse et artificiose machine del Capitano Augustina Ramelli dal Ponte della Fresia. Ingegniero del Christianssisimo Re di Francia et di Pollonia. Nellequali si contengono varii et industriosi movementi degni digrandissima speculatione, per cavarne beneficio infinito in ogni sorte d' operatione; composte in lingua Italiana et Francese. A Parigi in casa del'autore, co privilegio del' Re.* 1588; which modest title when done into English becomes: "The various skilful machines of Captain Augustine Ramelli, from the bridge of the Fresia; engineer to the most Christian King of France and Poland. Which includes many ingenious movements worthy of very great consideration for their utility in all sorts of work. Written in the Italian and French languages. At Paris in the house of the author; by the special consent of the King. 1588."

This book is an octavo of 338 pages, and is embellished with 195 excellent copper-plate engravings by Leonard Gualtier, and a portrait of the author, who, by the way, strongly resembles Shakespeare in appearance.

An extract from the dedication reads as follows: "My eyes are not so blind that they do not see the smallness of my intentions, and that they cannot diminish the magnitude and great value of the signal favours which your royal kindness has always extended in my interest. The peculiar affection which you have had for me was demonstrated at La Rochelle, when in your service I was severely wounded and taken prisoner, and especially by the particular attention and protection bestowed upon my son at Paris, and finally, by the very kind letters you deigned to write me from Poland."

The numerous machines illustrated and described in this book are, in the majority of cases, of Ramelli's own invention, and consist mostly of pumping machinery and various contrivances, other than pumps, for raising water from wells, etc.

In the light of modern design and practice of water-raising machinery, these appliances of course look very crude, straggling, and even unmechanical, but were nevertheless well advanced for their times.

They comprise such arrangements as (1) A combination of curved pump-barrel (semicircle), having two plungers curved to the same radius, and forming portion of a mutilated worm-wheel or sector, the driving worm of which is rotated alternately backwards and forwards—about three revolutions each way—by means of a horizontal water-wheel, through the media of mutilated crown-wheel, and two opposite lantern pinions keyed on to the wormshaft. (2) A water-raising machine, comprising a vertical single-acting pump of large bore and relatively short stroke, having a trunk piston, which trunk slides up and down water-tight on a stationary hollow hanging-ram forming the delivery-pipe, this being in communication with the pump-barrel space below the piston, and with a delivery-tank

and conduit high above the pump; it has a non-return delivery-valve at its lower end, suction-valves being fitted in the bottom of the big pump-barrel. There are two opposite straight racks formed on the outside of the trunk, with which are geared two lantern-pinions on parallel horizontal spindles rotated backward and forward two or three turns in either direction by means of a worm-pinion on each, which gear with worms of opposite hands formed on a common spindle, this spindle taking its reciprocating motion, through a pinion on it, from a pair of mutilated crown-wheels on a common vertical shaft, and gearing with opposite sides of the pinion alternately. The shaft with its two crown-wheels is driven continuously in one direction by a horizontal water-wheel on its lower end in a shallow well. It will be seen in this arrangement, that the trunk with its piston is reciprocated after the manner of the sliding-tubes in the focussing adjustment of microscope and camera lenses, etc.

There are three other arrangements in which an undershot water-wheel is employed, actuating sets of several single acting pumps: (1) Through slotted-end levers connected direct with cranks on the water-wheel shaft, thus giving a *quick return stroke;* (2) through a single crank and connecting-rod, working a rocking or weigh-shaft, having arms which work the pumps; and (3) through two mutilated lantern-pinions on the water-wheel axle. These pinions have half their working pins removed from opposite sides, and gear with two vertical racks which are alternately lifted and depressed by them, and so work a rocking-frame of inclined troughs lifting water from the level of the top of the water-wheel, to which height it is carried and discharged by buckets formed in the wheel, to a tank at a higher level.

There are two other arrangements of pumps worked by a species of tread-mill, the man treading within the wheel (recalling to mind the toiling donkey at the well of Carisbrook Castle), one driving a form of rotary pump through a pair of chain-wheels and quick worm-gear; the other works a pair of plunger-pumps, through the media of (*a*) spur gearing (geared up from the treadwheel); (*b*) a crank and connecting-rod; and (*c*) a pair of reciprocating chain-wheels.

Another form of pump illustrated, and well worthy of note, is one of a rotary type, hand-worked, bearing a striking resemblance to, in fact is identically the same in principle as, one form of rotary engine that has been made and tried of recent years. This has a cylindrical rotating piston, set eccentrically to a cylindrical shell of larger diameter, and fitted with rectangular pieces or deep feathers sliding in and out radially in slots formed in the solid piston and parallel to its axis.

This pump would doubtless have run well as a positive water-motor, if it had occurred to Ramelli, or other engineer of his day, to so apply it.

The use of the crank in these machines gives us another instance of its undoubted antiquity; and yet it was not employed to give rotative motion in some of the earliest forms of the steam-engine nearly two centuries later.

Besides the water-raising machinery, numerous forms of corn and flour mill are described by Ramelli, one being constructed wholly of iron, and having a conical serrated burr, rotated within an internally serrated conical shell of somewhat wider angle, *e.g.*, like the modern mills used for coffee-grinding, grain-crushing, etc. The general tendency in this antique machinery of Ramelli's, it will be noticed, is to a redundancy of gearing, needlessly complex and power-wasting, combinations of spur, chain and worm gears in the same machine, in some cases apparently geared up for the mere pleasure of gearing down again, or with a notion that the power applied is increased thereby.

The limits of this article forbid greater space being devoted to Ramelli's rare book, but the foregoing description of some of the machinery illustrated in it may be taken as fairly typical of the whole.

Edward Somerset, sixth Earl and second Marquis of Worcester, author of the famous and historical *Century of Inventions*, was born in 1601, at Worcester House in the Strand, was brought up at Raglan Castle, during which time and thenceforward he evinced and cultivated a taste and aptitude for mechanical pursuits, which he engaged in with zest and energy, aided by his lifelong assistant, the "unparalleled workman" as he was called, Caspar Kaltoff.

Having cast in his lot with the King (Charles I.), he was in 1645 despatched to Ireland to raise troops for the King's service, which mission—a secret one—miscarrying, he met with characteristic treatment from Charles, *i.e.*, disregard of past good services, coupled with disgrace and imprisonment for a short time in the Tower.

At the Restoration, however, he recovered part of his estates, greatly impoverished in the interests of the King. He claimed to have disbursed "for King and Country" the sum of £918,000.

About ten years after this he set about the writing of his rare and famous work, the title of which reads as follows:

"*A Century*
of the names and scantlings of such Inventions As at present I can call to mind to have tried and perfected, which (my former Notes being lost) I have, at the instance of a powerful Friend, endeavoured now in the year 1655 *to set these down in such a way as may sufficiently instruct me to put any of them in practice.*

"*Artis & Naturæ Proles.*

"*London: Printed by F. Grismond, in the year* 1663."

The Marquis of Worcester was not only a born mechanician, but also one of the greatest anticipators of modern "inventions" probably of whom we have any record, as exemplified by numerous items in his *Century*.

It will not be out of place to quote a few of these, that the mechanical reader may judge for himself.

Taking first the most important, being no less than the invention of the steam engine:

No. 68.—"An admirable and most forcible way to drive up water by fire—not by drawing or sucking it upwards, for that must be, as the philosopher calleth it, 'intra sphæram activitatis,' which is but at such a distance; but this way hath no bounder if the vessels be strong enough, for I have taken a piece of a whole cannon, whereof the end was burst, and filled it three-quarters full of water, stopping and screwing up the broken end, as also the touch-hole; and, making a constant fire under it, within 24 hours it burst and made a great crack, so that, having made a way to make my vessels so that they are strengthened by the force within them, and the one to fill after the other. I have seen the water run like a constant fountaine stream 40 foot high; one vessel of water rarefied by fire driveth up 40 of cold water; and a man that tends the work is but to turn two cocks, that one vessel of water being consumed, another begins to force and refill with cold water, and so successively, the fire being tended and kept constant, which the self-same person may likewise abundantly perform in the interim, between the necessity of turning the said cocks."

Now in this, the inventor's pet child, the Marquis of Worcester may be justly credited with having invented and produced absolutely the first practicable useful steam engine of any kind. This engine was actually at work employed in pumping (at Vauxhall, London), from 1663-1670. Savery claimed originality for this, but, as it was proved, dishonestly.

No. 58.—"How to make a pistol, carbine, musket, harquebuss, or saker discharge often with one loading, and without so much as once new priming requisite. . . . When first I gave my thought to make guns shoot often, I thought there had been but one onely exquisite way inventible: yet by severall trials, and much charge, I have perfectly tried all these."

Here we pretty clearly have the precursors of the modern magazine small arms, and the quick-firing and machine guns. The modern prototype of the following will be evident:

No. 93.—"An engine whereby one man may take out of the water a ship of 500 tun, so that it may be calked, trimmed, and repaired, without need of the usual way of stocks, and as easily let down again." If this invention is not an anticipation of the modern "patent slip-way," what is it?

It is quite possible, of course, for even a 500-ton ship to be so hauled up single-handed on one of these, being simply a matter of time and gearing. The "one man, however, would find it a particularly long and tedious job.

No. 10.—"A way from a mile off to dive and fasten an engine to any ship, so that at any appointed minute, though a week after, it shall irrecoverably sink that ship."

The noble inventor gives no detailed description of this (in common with practically all the other items in his *Century*), but it looks remarkably as if he must have had the germs of no less than three modern practicable inventions in his mind in this item alone: (1) A diving vessel, which, too, was evidently navigable under water—a prototype of the modern submarine boat; (2) a torpedo or submarine mine; and (3) a regulable time-firing mechanism (having a possible range of seven days), similar to that of the notorious "infernal machines" that we have unhappily heard and experienced too much of in recent years.

Although the Marquis of Worcester seemingly designed his unique *Century* chiefly to serve as a refresher to his own memory, it is a pity—in the interests of posterity, and to the end that his methods and means in many instances might not now be a matter of surmise—that he was restrained from being more explicit by the necessity of strict secrecy—the inventor's only resource prior to the institution of patents.

The Marquis of Worcester died in the year 1667, and was buried at Raglan.

Prince Rupert, nephew of Charles I., was born in 1619 at Prague. Although spending much of his life in military and naval pursuits, having been General of the Horse (to his uncle the King) in 1642, Admiral of the Royalist Fleet in 1648, and Lord High Admiral after the Restoration, he contrived to devote some time to mechanical and other scientific research, for which he had a special liking and aptitude.

It is recorded that "he delighted in making locks for fire-arms"; that he communicated to the Royal Society, through Dr. Robert Hooke, an account of an engine he had contrived for raising water, and an instrument for casting any platform into perspective; also an appliance to a ship's quadrant, which prevented the unsteadiness of the observer's hand when at sea by the motion of the ship from affecting the observation.

He is considered to have been the original inventor of mezzotint engraving (his first being produced in 1643), and is said to have discovered a means of melting and casting black lead (graphite) in a mould like metal. In the course of his melting experiments he invented (or accidentally made) the curious glass globules named after him—"Prince Rupert's Drops."

He was made Governor of Windsor Castle in 1666, and thenceforth led a comparatively retired life. He doubtless then found leisure for indulgence in his favourite pursuits.

The writer purposes to deal with one more celebrated mechanician to close the present paper, and thus cover a period of five centuries.

Robert Hooke was born in 1635 at Freshwater, in the Isle of Wight, where his father was rector, and destined him for the Church.

After his father's death in 1648, he was placed in the workshop of Sir Peter Lely, the famed portrait painter, and removed thence (about 1650) to the house of Dr. Busby, the famous headmaster of Westminster School. Here he is said to have made very rapid progress in mathematics.

In 1653 he entered Christ Church College, Oxford, as "servitor," taking his M.A. degree there ten years later.

During 1656 he was employed, on account of his great mechanical skill, by the Hon. Robert Boyle in the construction of his celebrated air-pump.

Between 1657 and 1659 he applied his inventive faculties to the devising and working out of "thirty different methods of flying," and on the balance wheel and spring for watches. Huygens disputed with Hooke the claim for originality in this. The original idea, however, was Hooke's.

In 1662 he was appointed Curator of Experiments to the Royal Society, which office he filled with remarkable ability during the remainder of his life.

After the great fire of London in 1666, he constructed and submitted to the authorities a model of a scheme or design for rebuilding the city, which, though highly approved, eventually gave place to Sir Christopher Wren's. Robert Hooke, however, was engaged as surveyor of this work during its progress, acquiring thereby several thousand pounds. (This sum, by the way, was discovered after his death put by in an old iron chest, which had lain unopened for more than thirty years.)

In 1664 Sir John Cutler founded for his benefit a mechanical lectureship, and in 1696

the Royal Society made him a pecuniary grant, to enable him to complete his mechanical and other scientific inventions. Unhappily, while so engaged "he died in harness" in the year 1702.

It has been said of Robert Hooke that "There was no important invention of that time which was not in part anticipated by Hooke."

He originated the idea of using the pendulum as a measure of gravity, invented the continuous pendulum or centrifugal ball-governor (wrongly ascribed to James Watt), the well-known "universal" joint or coupling, the "gimbals" in which ship's chronometers, etc., are hung, and the "anchor escapement"; also a form of water-wheel, known as "Hooke's water-mill screw." Moreover, he was the first to state clearly that the motions of the heavenly bodies must be regarded as a mechanical problem.

Domestic Mortars.

By Florence Peacock.

MORTARS are vessels which have come down to us from remote times—how remote we have no means of knowing—and when we consider how numerous they must have been, and how very difficult they are to destroy, one can but wonder that there are so few of them left. I use the word "few" in a relative sense, for scattered about the country there are specimens still to be picked up, and there are also public collections which contain examples—notably, the York mortar, of which I shall speak later; some, too, are in the hands of private collectors, and are not generally known to the world at large.

The earliest mention of mortars that I am acquainted with occurs in the Book of Maccabees, where it says, referring to the pillage of the Temple by Antiochus: "He . . . took away . . . the little mortars of gold."* The Vulgate gives it "mortariola aurea."

* *Maccabees* i. 23, Douay version.

It is impossible to be quite certain what these golden vessels were used for, but the most probable supposition seems to be that they were very small mortars made of the precious metal for the purpose of containing oil to burn for lights. But this is merely conjectural; they may have been intended to use for pounding spices in, although, if this were the case, they must have been alloyed to a considerable extent. Anything nearly approaching to pure gold would be too soft to stand continual pounding.

The earliest mortars that have come down to us are, as might be expected, of stone. Some of these are most beautifully executed by the American Indians, and are at times to be dug up, being buried with them. It is certain that they are of very early date, but how early it is impossible to say. There is one in the possession of ex-Alderman James Johnson, of New Westminster, British Columbia, who is a great local authority upon this subject, formed to represent a toad, the material out of which it is carved being jade. It has almost certainly been used to pound or grind paints in, as traces of a red pigment were to be seen when it was found. It was a common custom apparently for the Indians to form their mortars like animals, for the museum at New Westminster contains a specimen, each end of which is carved to represent the head of a fish, supposed to be a salmon. This is also made of jade.

In our own country there are some specimens of pre-Roman mortars known to exist, but very few of this age have come down to us. One is described by the Rev. J. C. Atkinson,* which must certainly have been made before the Roman invasion of Britain; it was found in Cleveland.

My father formerly possessed a stone mortar, which was dug up in Lincoln, and which may have been there before Lindum became a Roman station. It was most likely made either at Lincoln itself, or very near to it, for the stone out of which it is cut is the oolite, to be found in the immediate neighbourhood. It is fashioned with two lips for pouring from, and upon the opposite sides are two unperforated handles. It has been suggested, most likely accurately, that these stone mortars might be used, not only

* *Gentleman's Magazine*, vol. ccxv., p. 80.

for general household purposes, but also for pounding corn in. The use of stone mortars seems not to have died out, but to have existed onwards right through the Middle Ages concurrently with the use of metal ones; there are, however, very few of the early ones left, as I have before said.

A fine one was found at Monmouth Castle some years ago, and is described in the *Archæological Journal*.*

Chemists at the present day use mortars that are generally made of stone or marble, and there is a saying in a certain Midland county that when the chemist is pounding a prescription for a rich man, the sound the mortar makes says: "Live and linger, live and linger"; but when it is for a poor man, the sound changes to: "Die and be d——d, die and be d——d."

We in this age can but dimly appreciate the very different domestic arrangements that our ancestors dwelt amidst. In many ways we cannot enter at all into the life they led, strive we never so earnestly. At the present day there are many households which do not possess a mortar; but formerly, saving perhaps only in the cottages of the very poor, this could not have been.

A mortar was an absolute necessity of daily life in the ages ere any form of grinding machine had been invented

The careful housewife needed it for a thousand things. Did she possess any kind of spices or pepper — great rarities, and much valued during the earlier half of the Middle Ages — it was necessary to reduce them to powder in the household mortar ere she could season any confection with them. Then, again, eggs were usually beaten in mortars, and if the mistress of the family desire to pound up any simples either for home use or distribution to her poorer neighbours, it was necessary to seek the aid of the mortar and pestle. Whether the prescription was meant for internal or external application, it mattered not, for nearly all kinds of medicinal preparations that were not obtained by distillation or stewing were beaten in a mortar.

The use of the mortar entered into many more forms of cookery than it does in these days, and those who have not had some experience in the use of a mortar and pestle can have no idea how difficult it is to grind things finely therein. It is certainly true that the most unskilled amateur in the art of pounding can take the pestle and knock whatever substance the mortar may contain, but this is not proper pounding. The real art consists in knowing how to grind and crush the contents between the sides and bottom of the mortar, and the pestle, in such a manner that they shall pulverize or disintegrate equally and entirely with as little labour as possible to the pounder, and nothing save practice can achieve this end.

In the Middle Ages, no doubt, any household of importance possessed several mortars; one could scarcely have been sufficient; and we have evidence that they were valued and treated to some extent as heirlooms. We come across them in inventories, and find them mentioned in wills.

They were evidently esteemed of considerable pecuniary value, for in the reign of Richard II. Margaret Legatt, of Wootton, gave Thomas, Lord Berkeley, for a legacy a brass mortar and iron pestle, and to Lady Margaret, his wife, a ring of gold, and to other ladies of his family gold rings.* This shows two things clearly: firstly, that it was not considered necessary that the pestle and mortar should both be of the same metal; and secondly, that a pestle and mortar had about the same value as a gold ring.

It ought to be understood, however, that when the word "brass" was used to denote a mortar that what was meant by it was almost always either bell-metal or bronze, not what we understand by brass.

There were also, at least, two other purposes for which mortars were needed in the Middle Ages besides those which I have already mentioned. No one who brewed love potions could possibly have done without a mortar in which to pound certain of the ingredients, and to all who dealt in magic and the black art they were an absolutely necessary portion of the stock-in-trade.

Then, also, mortars were used as vessels in which to burn lights, or support torches. Dr. Rock† gives the following interesting

* Vol. xlviii., No. 191, pp. 203, 204. 1891.

* Southey, *Common-Place Book*, vol. i., p. 474.
† *Church of Our Fathers*, vol. iii., part i., p. 89.

details regarding the use of mortars at funerals, quoting from the will of Richard, Earl of Arundel, in 1375, "that no men-at-arms, hearse, or other pomp be used at my funeral, but only five torches with their mortars."

And we again find, more than twenty years later, that Eleanor, Duchess of Gloucester, in 1399, thus directs: "My body to be covered with a black cloth, with a white cross, and an escutcheon of my arms in the middle of the said cross, with four tapers round it, and four full mortars being at the four corners."

These funeral mortars are believed to have stood or rested upon a stand or branch, and it is thought that sometimes they were filled with oil and sometimes with wax; they had, of course, large wicks in them. I believe that down to the present day tiny mortars holding sweetly-scented wax are placed before the shrine of St. Peter and St. Paul at Rome on June 29, the festival of the two Apostles.

Mr. Albert Hartshorne, of Bradbourne Hall, Derbyshire, possesses a very early metal mortar; he obtained it at Colchester, and was informed that it had been found amongst the Romain remains there. No one can be absolutely certain whether it is a Roman one or a very early mediæval specimen; but I am inclined to think it is Roman, on account of being found amongst objects unquestionably made by them. It is $4\frac{3}{8}$ inches in height by $4\frac{7}{8}$ inches in diameter.*

Unfortunately, the metal of which mortars are composed has some little value when melted down, and this fate often overtakes fine specimens even now. Somewhere about twenty-five years ago my father had one described to him by a general dealer who attended all the sales for many miles round. "Billy fra' Brigg" was a well-known character and a keen man of business, but he had no idea of the value of mortars, for he broke up the one in question before my father knew of its existence.

From the account of it which its owner gave, I should judge that it must have been either of early seventeenth-century Dutch make, or a magnificent example of the later mediæval English period.

* This mortar is engraved in the *Archæological Journal*, vol. xl., p. 106.

The mortar now preserved in the museum at York is by many people considered to be the finest mediæval specimen in England, and it probably is so, but there may possibly be some as good or even better in the hands of people who know nothing of their value or interest.

This York mortar has upon it two inscriptions, divided from each other by two sets of quatrefoils, containing within them lions, griffins, and birds. The topmost inscription is as follows:

✠ MORTARIU' SCI' JOH'IS EVANGEL' DE I'FIRMARIA' B'E MARIE EBO'.

And the lower one runs thus:

FR' WILL'S DE TOVTHORPE ME FECIT A.D. M. CCC. VIII.

The *Gentleman's Magazine* for 1813* contains an engraving of this mortar, but it is a very poor one, and does but little justice to it.

I believe the finest collection of mortars now existing in private hands in this country is contained in the Collection of Mr. England Howlett, of Kirton-in-Lindsey. He possesses nine specimens: six of them English, two Dutch, and one of doubtful nationality.

The older of the two Dutch mortars is an exceedingly fine one; it is 5 inches high, and just under 6 inches in diameter. Round the top there is a plain band seven-eighths of an inch in depth; then follows the inscription, which is in raised letters on a sunken band between two lines, and reads:

LIEFVR DE VERWINT ALLE DINCK. A. O. 1607.

There is a stop formed thus ■ between each word.

This inscription is a corrupt Dutch rendering of "Amor vincit omnia" (Love conquers all things). Chaucer appears to have considered it a well-known motto in its Latin form, and he made the Prioress have it engraved upon her bracelet. It seems to have come originally from Virgil,† though he places the words rather differently: "Omnia vincit amor, et nos cedamus amori." I shall have occasion

* Vol. lxxxiii., p. 17. We hope to be able to give an illustration of this fine mortar in the second part of the paper.

† *Eclogues*, x., l. 69.

again to refer to this motto. This mortar grows much narrower towards the centre than it is usual for English mortars to do; but it is a form often to be seen in those that were made in the Low Countries during the seventeenth century. There is a band of conventional foliage following upon a plain space below the motto, then a narrow band or line, and a scroll-work which is much worn, and appears to consist of double-headed outspread eagles and medallions containing crabs. The handles are placed rather low, starting at the narrow line between the two scrolls and finishing at the bottom of the ornamentation. They appear to be formed of some kind of snake or fish, with a head and open jaws at each end; the upper jaw seizes a small peg-like projection from the mortar; the lower jaw remains open, being twisted round somewhat after the shape of an ear, and it is attached to the mortar by the same peg-like arrangement from the back of the head. This mortar was originally in the collection of the Hon. Frederick Walpole, of Rainsforth Hall, Norfolk.

The other Dutch mortar in Mr. Howlett's collection is rather small, being only $3\frac{7}{8}$ inches

DUTCH MORTAR, 1638.

high; diameter, $3\frac{1}{2}$ inches. The arrangement is much the same as the Dutch one I have previously described. It has the same flat plain band round the top, followed by the raised motto and sunken base between two lines:

LOF GODT VAN AL, AO 1638.

Below follow the two bands of ornamentation, in this case divided by two bands of moulding, and being of a conventional foliage pattern. The handles are conventional ones, and placed like the other Dutch one. The editor of the *Antiquary* possesses a very similar mortar with the same inscription, but with an earlier date, viz., 1597. Height, $4\frac{1}{4}$ inches; diameter, $4\frac{5}{8}$ inches. It was bought, in 1873, at Utrecht. The motto means "Praise God above all," and is very often to be found on Flemish mortars.

The following mortar is perhaps the most interesting of all the specimens in Mr. Howlett's collection. It is a somewhat roughly-cast mortar, and stands just under $5\frac{1}{2}$ inches in height, with a diameter of 7 inches; the handles are ear-shaped, but very beautifully formed of strands of the metal plaited together. Round the rim runs the legend:

RICARDVS ME FECIT HOLDFELD.

And on one side of the mortar between the handles is "GILBERT," and upon the opposite side "MORDEN," this being obviously the name of the owner.

The letters upon this mortar are not placed separately, but each word is upon an oblong raised casting. The owner's name is in a totally different style of lettering to the inscription. Below come two mouldings, and the remainder of the mortar is unadorned.

The great point of interest about this mortar is that it was cast by Richard Holdfeld.

The Holdfields, Holdfelds, or Oldfields, were a well-known family of bell-founders, and there can be but little doubt that this Richard was a member of it; but I have failed to make out his exact connection with its more celebrated members.

His best known work is the clock bell at Trinity College, Cambridge, which bears the following inscription:

RICARDVS ✱ HOLD ✱ FELD ✱ ME ✱ FECIT.
TRINITAS ✱ IN ✱ VNITATE ✱ RESONAT ✱ 1610.

The lettering is slightly larger than that upon the mortar. Two years later it ap-

pears that Richard Holdfeld cast the first and second bells for the Church of St. Andrew, Chesterton, Cambridgeshire. The first bell bears upon it:

SO NORO SORO
MEO SONO DEO 1612,
RICARDVS HOLDFELD ME FECIT.

The second one has on it:

GOD SAVE THY CHURCH, 1612.
RICARDVS HOLDFELD ME FECIT.

The remaining three bells were not cast by him. His work is also to be seen in several other places. The third bell in the Church of All Saints, Little Shelford, Cambridgeshire, has upon it:

RICARDVS HOLDFELD ME FECIT. HENRY WRYESLE,* EARLE OF SOVTHAMPTON, 1612.

Most likely the Earl of Southampton had presented the bell to the church, and it is especially interesting, as it clearly shows us how the name of Wriothesly was pronounced in the beginning of the seventeenth century.

There are other bells known to be by Richard Holdfeld, but so far as I am aware none have been found dated earlier than 1599, or later than 1612; so in all probability the date of Mr. Howlett's mortar must be between these years.

We now come to an English example, which has recently been acquired from Epworth, in the Isle of Axholme. Height. $3\frac{3}{4}$ inches; diameter, $3\frac{3}{4}$ inches. It has two narrow mouldings near the top, and upon the sides, repeated three times, is a bust of Charles II. surmounted with the crown, which is on a level with the moulding. The King is wearing what appears to be the badge and collar of the Garter.

HOLDFELD MORTAR.

Mr. Howlett also possesses a second mortar, with the head of the same monarch upon it crowned in a similar way; but the bust is enclosed in a medallion, and the casting is so injured by ill usage that it is not clear whether the King wears the Garter badge or no. This mortar is considerably larger than the one previously described, being $5\frac{1}{2}$ inches high, by 7 inches in diameter.

I have never seen or heard of a mortar bearing upon it the head of Charles I., yet it is only natural to suppose that ardent Royalists would put the head of their martyred King upon mortars cast after 1648.

(*To be continued.*)

* Henry Wriothesly, Earl of Southampton, succeeded to the title in 1581; died 1624.

The "Lady Fast" Wheel.

By Henry John Feasey.

THROUGHOUT the golden days of English chivalry the Blessed Virgin Mother reigned as Queen—Queen of all hearts, the chiefest Elect Lady, whose name and colours all were proud to wear. The flower of European knighthood vowed themselves champions to her and all that was hers, the exotics of the cloister devoted themselves body and soul to her worship and honour. King and priest, monk, knight, and minstrel, sang her praises in chant and song. Some orders of religious donned a habit "white as morrow's milk" in token of her chastity, immaculately pure; others a garb of black, in memory of her *dolores*. To sure and certain victory warriors went with the war-cry, "For God and Our Lady," and the exhibition of her smock upon the city ramparts struck terror to the heart of her foe. Maidens crowned her images with lilies, the lovers with roses, and the poor penitent Magdalene, too—like Faust's Marguerite—came by night with her hands full of white flowers, tear-bedewed, to lay beneath her feet.

Whilst some feasted, clad in white surplices in honour of that "dear Dove of Paradise," and gave alms for her name's sake, others indulged in works of mortification and fasting in equal honour of her.

"Let all Saint Mary's feast-tides be strictly honoured," says an ordinance to be found among the laws of King Athelred, "first with fasting, and afterwards with feasting."

But out of pure devotion to the Lady, dearest and fairest above all, many pious souls mortified themselves to an extra degree in honour of her by keeping a fast, unimposed by any precept of the Church, called a "Lady Fast," a practice taken upon themselves by others who, on the one hand, were indebted to her for received benefits attributed to her intercession, or who, on the other, were anxious to enlist her interposition to gain the same or avert some dreaded evil.

Thus *Piers the Plowman* tells us that:

Lechery said, "Alas!" and on our Lady he cried
To make mercy for his mis-deeds between God and his soul,
With that he should the Saturday, seven year thereafter,
Drink but with the duck, and dine but once.*

Saturday, even prior to the eleventh century, had become to be regarded as a kind of weekly festival of the Blessed Virgin.† Bower‡ complains of those careless prelates "who suffer the common people all the year through to vary after their own will the days kept as fast-days in honour of Mary; whereas it was on the Saturday, the first Easter Eve, that she abode unshakenly in the Faith when the Apostles doubted; and therefore, for that reason, with other causes aforesaid, the Saturday is dedicated to her as a fast. But now you will see both men and women on a Saturday making good dinners, and even eating eggs, who on a Tuesday or Thursday would not touch a crust of bread, lest they should break the Lady fast kept after their fancy."

The observance of such variation from primitive doctrine and practice was the bane of the life of the reformers. Tyndale complains grievously of the "open idolatry" of innumerable fasts—St. Brendan's, St. Patrick's, "Our Lady Fast, either seven years the same day that her day falleth on in March, and then begin, or one year with bread and water."§

The Lady Fast would thus appear to have been a severe one, for *Piers the Plowman*, as we have seen, describes it as a "drink with the duck, and dine but once," and Tyndale as "bread and water." On this scant fare the devotee elected to fast for a certain period, generally for seven years, commencing on that day of the week on which the Lady Day happened to fall, beginning his course from that day forward, and fasting one day in each week for seven years—altogether a year's fast—or finishing sooner by taking as many fasting days together as would amount to one whole year.

It seems to have been *de rigueur* that the

* B. text, Passus v. 72-75.
† Continuator of Fordun's *Scotichronicon*, bk. vii.
‡ *Vide* writings of St. Peter Damian.
§ *Exposition* (Parker Society, 1848), vol. ii., p. 98.

"Lady Fast" should commence on one of the Lady Days or festival days of the Blessed Virgin of the year, which to the number of *six*—the feasts of her Conception, Nativity, Annunciation, Visitation, Purification, and Assumption—are marked in the calendar. Tyndale says it began on the Annunciation feast, at that time the first day of the legal year; but it is probable that all the Lady Days were at the choice of the person desiring the special devotion, or were determined by chance in the cast of the die, the ace, deuce, and tray representing the Lady Days numbered one, two, three, and so on to the number of six.

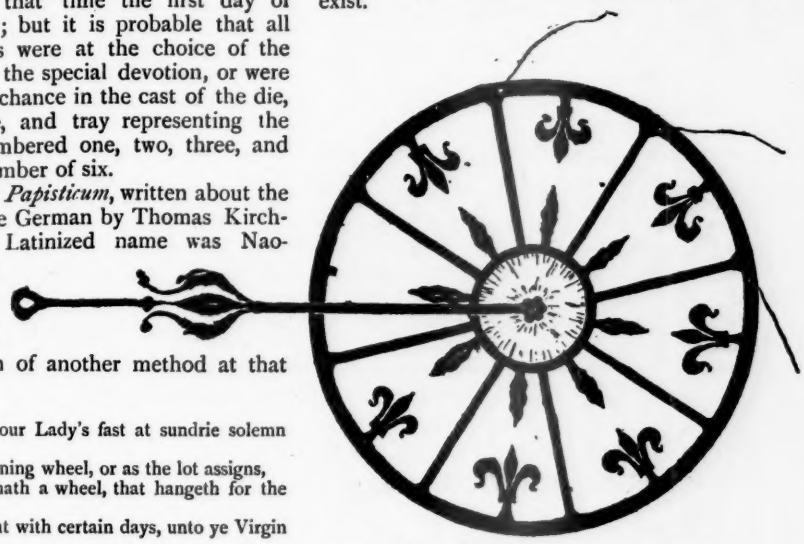
The *Regnum Papisticum*, written about the year 1559 in the German by Thomas Kirchmeyer, whose Latinized name was Naogeorgus, and Englished by Barnabe Googe in 1570, gives us a description of another method at that time in use:

Besides they keep our Lady's fast at sundrie solemn tymes
Instructed by a turning wheel, or as the lot assigns,
For every sexton hath a wheel, that hangeth for the view,
Mark'd round about with certain days, unto ye Virgin due;
Which holy thro' ye year are kept, from whence hangs down a thread
Of length sufficient to be touch'd, and to be handled.

Now when that any servant of our Lady cometh here,
And seeks to have some certain day by lot for to appear,
The sexton turns the wheel about, and bids the stander by,
To hold the thread whereby he doth the time and season try.
Wherein he ought to keep his fast, and every other thing,
That decent is and longing to our Lady's worshipping.

Of this curious contrivance for determining on which of the six Lady Days in the year such a "Lady Fast" should be kept only two examples, and these both in East Anglian churches, have been preserved. One of these, in the church of Long Stratton, Norfolk, is more perfect than the other, which remains at St. Mary's Church, Yaxley, in the neighbouring county of Suffolk. It was to the late Rev. W. H. Sewell, Vicar of Yaxley, that we are indebted for the unravelling of the mystery in which this instrument and its use was previously involved.

The date assigned to these wheels is the fifteenth or early sixteenth century, and curiously enough, although great objections were raised by the Continental reformers to their use, no foreign example is known to exist.



THE "LADY FAST" WHEEL, LONG STRATTON, NORFOLK.

The wheel, or rather the pair of exactly similar concentric wheels cut out of sheet iron at Yaxley are separated, and measure a little over 2 feet in diameter, but the wheels at Long Stratton are held together by a pin which passes through the centre of each, and round which each revolves independently of the other upon the same central axis.

Attached to the wheel by the same pin are the two extremities of the long, hanging, forked, pendant handle by which the instrument was held by the sexton or hung up.

In each of the wheels are pierced three holes, through which were passed a like number of strings, corresponding to the *six* feasts sacred through the year to St. Mary, and perhaps also to the six days of the week, for Sunday could never be observed as a fasting day.

The devout person, therefore, desirous of keeping a "Lady Fast" would go to the church to solicit the aid of the wheel in determining which of the fasts he or she should keep. The sexton would take the wheel, and either hang it up or hold it forth at arm's length by means of the ring at the end of the handle, and set it in motion, while the would-be devotee, standing by, would catch at the strings as they whirled round with the revolving wheel. The string caught—supposing it to be, for instance, number three or number six, standing for the feasts of our Lady's Annunciation (Lady Day) or of her Assumption (Lady Day in harvest)—would at once decide the question, and the Lady Fast would begin to be kept, in the former case on the twenty-fifth day of March, the festival commemorating the "Gretynge of Our Ladye," and in the latter on the fifteenth day of August, our Lady's feast-day in harvest.

Publications and Proceedings of Archæological Societies.

PUBLICATIONS.

Part I. of vol. vi. of the *Journal of the Chester Architectural Archæological and Historic Society* has been issued. It contains the following among other papers: (1) "The Salmon Clause in the Indentures of Apprentices," by Dr. Brushfield. This paper and the subject it deals with we have alluded to in another part of the present number of the *Antiquary*, as we have also done with the suggestion for a "Historic Dictionary of Place-Names," which is made in the paper which succeeds it, namely, that entitled (2) "The Antiquity of Place-Names," by Mr. Haverfield. These papers are succeeded by (3) "Effigy in Holy Trinity Church, Chester" (illustrated), by Messrs. S. W. Williams and Henry Taylor; (4) "Six Early Deeds relating to Property in Northgate Street, Chester," by Mr. Henry Taylor; (5) "Two Chester Madrigal Writers," by Dr. Bridge; (6) "Souling Songs," also by Dr. Bridge; (7) "The Roman Altar found in 1896 near Warrington," by Mr. Haverfield; (8) "Owain Glyndwr and his Times," by Professor Tout; and (9) "John Wythines" (illustrated), by Canon Morris. In addition to these and the Report of the Council, etc., for 1895-1897, there is a photographic facsimile of the Deed of Exemplification, by Earl Randle Gernons, of gifts to the Abbey of St. Werburg, which is given as a frontispiece to the *Journal*. The paper dealing with it is, however, deferred to a future number.

The third part of vol. vi. of the *Transactions of the Essex Archæological Society* has reached us. It contains the following papers: (1) "Some Essex Family Correspondence in the Seventeenth Century," by Mr. J. H. Round; (2) "Discovery of Late Celtic Pottery at Shoebury," by Mr. H. Laver; (3) "Great Canfield Mount," by the Rev. E. A. Downman; (4) "Some Additions to Newcourt's *Repertorium* Vol. II.," being notes by Mr. J. C. Challenor Smith; (5) "Essex Field-Names" (continued). This portion of Mr. Waller's useful collation of Field-Names comprises those of the "Hundreds of Rochford, Denzie, and Thurstable," by Mr. W. C. Waller.

PROCEEDINGS.

At a general meeting of the ROYAL ARCHÆOLOGICAL INSTITUTE on July 7, Mr. F. G. Hilton-Price, F.S.A., exhibited a silver water-bailiff's mace, 6 inches long, consisting of a tube or barrel surmounted with the royal crown. At the lower end of the tube is a small seal-shaped cap which unscrews. This tube or barrel is the receptacle for a silver oar $4\frac{1}{16}$ inches in length. When the water-bailiff or constable was ordered to board a ship to arrest some offender he would proceed to unscrew the end, withdraw the little oar, refix the cap, and screw the oar into a hole in the cap, thus forming an instrument $10\frac{5}{8}$ inches in length. When closed it formed a constable's staff for service on shore. The hall-mark on the mace is nearly obliterated, but the shaft of the oar bears a hall-mark with date, letter P for the year 1830, and the maker's mark F. H.—Chancellor Ferguson exhibited a hippo-sandal into which he had placed a horse's hoof, showing it to be undoubtedly a horse-shoe, and probably used to protect a broken or injured hoof. It was discovered in a Romano-British village near Kirkby Lonsdale in Westmoreland. He also exhibited two hippo-sandals of neo-archaic date, one from Poulton-in-the-Fylde in Lancashire, the other from the banks of the Solway, and both formed to enlarge the surface of the tread, so as to prevent the horse sinking in the soft mosses once peculiar to the districts. Chancellor Ferguson also exhibited three photographs of an iron chest which was recently brought to light in the Post Office at Carlisle, being very similar to one in the Iron Room at South Kensington Museum, and labelled "Coffer or Deed Chest, wrought-iron painted, German, sixteenth century."—Mr. Somers Clarke, F.S.A., read a paper on "Some Social Customs of the Copts." The paper, written in English by a Coptic gentleman in Cairo, Simaika Bey, was a brief account of the customs observed at weddings, christenings, and on the death of a relative, most of these usages being of the highest antiquity, some dating unquestionably from pre-Christian times. Many of these are fast disappearing. The writer explained that in the matter of the choice of a wife the parents acted entirely as they thought fit, the young people having no voice in the matter. The ceremony of betrothal was described, and of the celebration of the wedding, with the illumination of the house, feasting, etc., and finally of the actual wedding or "crowning" ceremony, celebrated either at the bridegroom's house or in the church. The customary ceremonies at the birth and christening of a child were described. The child receives its name

on the seventh day after birth, but is not usually christened until the lapse of, in the case of a male child, forty days, or of a female eighty days, this ceremony always taking place in church. The retention of senseless customs at the occurrence of death was regretted, frightful lamentations and cries on the part of the women, hired singers to proclaim the virtues of the deceased—virtues perhaps undiscovered until the last moment. For forty days after death the women of the house cry and wail two or three times a day, and the mourning continues a whole year. An intense conservatism retains these customs amongst the women, whilst they are viewed with regret by the men.—Professor Bunnel Lewis, F.S.A., read a paper on the Gallo-Roman Museum at Sens. It consists of stones discovered by excavating the walls of the city; they had been taken from sepulchral monuments and other structures, and used as building materials to fortify the place against attacks of barbarians. The stones may be divided into two classes, those that are inscribed and those that are sculptured. Amongst the former the most remarkable inscriptions, seven in number, relate to the family of Magilius Honoratus, which held a high position at Lyons also. Another epigraph is short but interesting; it records the erection of a colonnade and covered walk (*porticus et ambulatorium*), and a distribution of wine and oil by magistrates, probably Ædiles, at their own expense (*propriis impensis*). The reliefs include a great variety of subjects—mythological, domestic, and funereal. Most important among them is the one that represents a scene from the legend of Iphigenia in Tauris. Orestes appears as a prisoner with his hands tied behind his back; but the priestess desires them to be loosed because he is a victim devoted to the goddess Diana (Artemis). In this series we find many persons engaged in the trades and occupations of daily life, *e.g.*, a bird-catcher, a fuller, a tailor, a musician holding cymbals, and painters decorating the walls of a house al fresco. Architectural fragments are very numerous—cornices, capitals of columns, and friezes—indicating the great prosperity of the city under the Roman Empire.

On July 7 and 8 the NORFOLK AND NORWICH ARCHÆOLOGICAL SOCIETY made a two days' excursion to the Wells district. The first day's programme included Little Snoring Church, Great Snoring Church and Rectory House, Walsingham Abbey, Binham Priory, and Holkham Hall. The first object visited was the curious parish church of Little Snoring, which is dedicated to St. Andrew. Its round tower, which roughly suggests a decapitated windmill, is detached from the church, a space of about 8 feet intervening. On the north side of the church, which is transitional Norman in date, there is a blocked-up Norman doorway. The font is of late Norman workmanship, and is enriched with sculptured foliage. The Rev. W. Martin, the rector, acted as cicerone to the party. While disclaiming any special authority to speak on the antiquities of his church, he read a short paper pointing out its principal features. He said he thought there was good ground for the supposition that the detached tower had belonged to an older church, and in this theory Dr. Bensly expressed concurrence. The arch of the south door was also a worthy object for speculation, there being details of workmanship about it which merit close and critical examination. On the conclusion of Mr. Martin's paper, Dr. Bensly conducted the visitors round the edifice, pointing out its beautiful Norman doorway, and features in the masonry illustrative of various styles of architecture, particularly Norman, Early English, and Perpendicular.—The church at Great Snoring was the next object of attention. It is dedicated to St. Mary, and is a fine handsome edifice, distinguished prominently by a square western tower. The east window is of the Decorated period, all the others being Perpendicular insertions. The chancel arch, tower, and porch are of the same architectural order. The arches of the nave and south doorway are Early English, while the sedilia and piscina, which are much mutilated, are Decorated. The font is Early English. Ascending the three-decker pulpit, the Rev. R. P. Roseveare, the rector, read a brief paper. The church, he said, dates from the fourteenth century, and shows signs of restoration and enlargement in the fifteenth century. In the sanctuary are remains of a fine brass of a knight and his lady. Blomfield read the legend as being to the memory of Sir Ralph Shelton and his lady Alice. Sir Ralph died in 1424. Behind the altar, erected into the east wall, are evidently the four sides of an altar tomb. Blomfield calls attention to a marble monument on the north wall to a former rector, Robert West (1610), and another to Edward Fenn (1710). The three-tiered sedilia is one of the treasures of the church, though decay and patchy alterations have impaired its beauty. Another treasure is the rood-screen.—Scarcely of inferior interest to the parish church is the rectory house of Great Snoring, a handsome specimen of ornamental brickwork of the time of Henry VIII. It was built by a member of the Shelton family, whose family rebus, a shell surmounting a tun, forms a prominent feature in the ornamentation of the brickwork. The building attracted the attention of Pugin, who suggested that when complete it formed a pentagon.—The next stopping-place on the list was the handsome church of New Walsingham, which comprises nave with aisles and clerestory, south and west doors, transepts, chancel, and low west tower surmounted by a curiously twisted spire. The principal object of interest in the church is undoubtedly the celebrated font, and it has been claimed that it is the finest in England. It is of the Perpendicular period, and its form is octagonal. On its upper panels are richly-sculptured representations of the Seven Sacraments and the Crucifixion, while round the shaft are the four Evangelists and other subjects. It has been frequently illustrated in books on Gothic architecture. The Rev. H. A. Wansbrough, the rector, conducted the party over the church, and in describing the upper panels pointed out that the one representing confirmation showed the subject of the rite to be an infant. The fact that infants were confirmed at the date of this font, which would be the late fifteenth century, was explainable on the ground that the visit of a bishop in those days was necessarily very rare, and therefore parents did not neglect to avail themselves of his presence merely because of the infancy of their children. Dr. Cresswell remarked that sometimes the rite was administered

by the bishop seated on his horse. The date of the church, Mr. Wansbrough went on to say, is probably about the same as that of the font. The present church is later than the porch. On the tower is a string-course, and there are other indications which seem to show that there was an earlier nave of much lower pitch. The moulding of the arcades is of different design on the north and south sides of the nave. The chapels are of different date to that of the church, as is evident from the depressed Tudor arches. They were added probably by the guilds in the early sixteenth century. One of them contains recumbent effigies erected in the seventeenth century to Sir Henry Sidney and his wife. Sir Henry belonged to the same family as the more famous Sir Philip Sidney. The figures are remarkable for the beauty and detail of workmanship. In the same chapel is preserved the foot and socket of a churchyard cross, which is clearly of Perpendicular design, and also a tombstone bearing certain characters, which Mr. Wansbrough felt himself unable to explain. One of the party remarked that it was probably the coverstone of the tomb of a priest, but to this the rector took exception on the ground that if so stones of that sort would be more common.—For an hour the party then suspended their journey, in order that they might lunch at the Black Lion Inn. Dr. Bensly presided in the absence of the president, Sir Francis Boileau, who was still too unwell to undertake an archæological excursion, and from whom a letter was received to that effect. Luncheon over, a visit, still under the guidance of Mr. Wansbrough, was made to the ruins of the famous abbey. These have on various occasions engaged the attention of the society, the last visit, we believe, being so recent as three years ago.—From an archæological point of view the interest of the excursion undoubtedly culminated in a visit to the Benedictine Priory of the Blessed Virgin at Binham. The nave is still used as the parish church of Binham, and covering an enormous area there are scattered round remains indicating roughly the plan and extent of the ancient priory. Mr. Leonard G. Bolingbroke, the hon. secretary of the society, had prepared a plan of the priory as it was in its prime, and written some explanatory matter, copies of which were distributed among the members.—Mr. Bolingbroke followed this up by reading a paper, for which at its close the members thanked him warmly. He said that the Priory of Binham was founded by Peter de Valoines, a nephew of William the Conqueror, and Albreda his wife, before the year 1093, being dedicated to St. Mary, but the endowment does not appear to have been completed until the time of Henry I., between 1101 and 1107. It was made a cell of St. Alban's Abbey, and had to pay a mark of silver annually to the parent monastery, and provide for the reception of the abbot once a year for eight days, he to have only thirteen horses in his train. The number of monks was not to be less than eight, and the heirs or successors of the founder were to remain patrons. During the twelfth century we hear little concerning the priory, but its wealth and possessions were increased by further endowments from the descendants of the original patron, and by a grant of a fair by Henry I., while the monks were doubtless busy building their church during the first quarter of the century, as the work of the nave, transepts, and chancel is all of the early Norman period. In the reign of King John, about 1212, Robert FitzWalter claimed to be patron of the priory, and was upon the most friendly terms with the then Prior Thomas. In consequence of this friendship the Abbot of St. Alban's removed the prior, upon which FitzWalter produced an alleged deed of patronage, which provided that the prior of Binham should not be removed without the consent of the patron, and he forthwith besieged the priory, causing the monks great hardships, and compelling them to eat bread made of bran, and to drink the water from the rain-water pipes. The King, hearing of the siege, is said to have sworn according to his usual oath: "Ho, by God's feet, either I or FitzWalter must be King in England. Ho, by God's feet, who ever heard of such things in peaceable times in a Christian land!" An armed force was at once sent to the relief of the priory, and the siege raised, while FitzWalter fled for his life. An obituary of the Abbey of St. Alban's from the year 1216 to 1253 is extant, in which are recorded the deaths of some ten or twelve monks of Binham, amongst others that of Alexander de Langley, who died here on December 26, 1224. This man's story is a peculiarly sad one. He had at one time been prior of Wymondham, and had then returned to St. Alban's, where he was appointed keeper of the abbot's seal, and acquired considerable reputation as a letter writer. Owing, however, to over-study, he became insane, and when the inmates of the abbey could no longer put up with his outbursts of frenzy, he was publicly censured in chapter by the abbot and flogged "to a copious effusion of blood," and then removed to Binham, where, in obedience to the especial command of the abbot, he was kept in fetters in solitary confinement until his death, and even then was buried at Binham in his chains, doubtless in the cemetery which was on the north side of the church. The priory, no doubt, had sustained considerable damage and loss during FitzWalter's siege, and a strong leader was required to make things straight again. Fortunately such a one was found in Richard de Parco, who was prior for seventeen years, from about 1227 to 1244. By his industry and diligence much additional property was acquired, and he seems to have looked well after the legal rights of his house, if we may judge from the number of lawsuits in which he engaged. In one suit, against the Prior of Walsingham, the result was anything but satisfactory to the litigants, who both claimed to be entitled to present to the living of St. Peter of Great Walsingham. The bishopric being vacant, the episcopal powers were vested for a time in the Archdeacon of Norwich, who, before the case could be tried, instituted his own nephew, *per fraudem et collusionem*, says the chronicle. Certain of the properties acquired by Prior Richard were charged with annual sums for specified objects. Thus the church of Little Ryburgh paid five marks towards providing wine *in munitione monachorum de Binham*, which presumably means for the use of the monks of Binham when they were bled; and the windmills of Edgefield and Wells were charged with a mark and a half to provide two cassocks and three other garments (stragulæ), while it was further provided that on those days when the monks of Binham did not have gruel or cheese by custom, they were for the future to be furnished by the church of Ryburgh.

The memory of Richard de Parco must, indeed, have been cherished in Binham for many a year after his removal to the Priory of Tynmouth, in 1244. It is to Richard de Parco, too, that the beautiful Early English west font is due. If it be true in families that a man often makes money for his heirs to spend, it is equally true of monastic institutions. We have seen Richard de Parco doing his best to enrich his house, and our next glimpse of Binham relates to a spendthrift prior. William de Somerton was appointed prior of Binham by Abbot Hugh in 1317. He appears to have been intensely interested in the study of alchemy, under the auspices of a certain mendicant friar, and to have spent immense sums in this pursuit, thus impoverishing the priory. On the top of his extravagance came certain undue exactions by Abbot Hugh, so that it was difficult even to procure food for the monks. When, therefore, Abbot Hugh proposed to visit his cell of Binham, the prior, supported by the Earl of Leicester and Sir Robert Walpole, with their followers, who encamped around the priory, forcibly resisted the visitation. The abbot appealed to Edward II., who ordered the prior's supporters to return home, and issued a writ for the arrest of the prior and his monks, who appear at that time (*circa* 1321) to have been thirteen in number. Meanwhile, the prior had fled to Rome, but six of the monks were brought to St. Alban's, and for a time imprisoned there. Eventually, at the request of powerful friends, William was reinstated as prior, but his pecuniary embarrassments again drove him to flight in 1335, from which time he passes out of the history of the priory, leaving behind him a debt of over £600. In the year 1433 the prior and his brethren are once more in sad trouble. Bishop Alnwick of Norwich is holding his visitation, and on his approach to the parish of Binham the prior and his monks are frightened out of their wits and keep within their walls, declining to show the slightest mark of respect, even to the tinkling of the convent bells. The townspeople, on the other hand, being unfriendly to their monastic neighbours, hurried forth to meet the slighted prelate and to obtrude upon him their sympathies. Returning them thanks, and concealing his indignation, the Bishop rode through the town as if nothing had happened. Having occasion, however, soon after to nominate collectors of the King's half-tenths lately granted by the clergy, the Bishop, in revenge, and despite the prior's alleged right of exemption, sent letters mandatory to the prior to the effect that he had been nominated to the office of collector within the archdeaconries of Norwich and Norfolk. Divining its contents, the prior declined to receive the letter, begging the bearer to take it back to his master. This, however, he declined to do and, after forcing it upon the prior, reported to the Bishop that the letter of the great prelate had been trodden underfoot by the miserable prior, and himself subjected to abuse. The result of the quarrel was a great lawsuit with the Abbot of St. Alban's, out of which the monastic chronicler represents the latter as coming victorious. In 1454 Henry Halstead was appointed Prior of Binham. He appears some time previously to have seceded from St. Alban's and become Prior of Wymondham, and afterwards (probably regretting his secession) sought readmission into the abbey, and to be appointed Prior of Binham. In this he succeeded, after some opposition from the monks of St. Alban's, upon promising to rebuild and repair the Monks' Frater at Binham, which was "collapsum et ruinosum," so suitably and honestly that the brethren could once more sleep in it. The immediate successor to Halstead as prior was William Dyxwell, who was appointed in 1461. In the following year the abbot held a visitation of Binham by commission, and on January 7, 1463 (probably as a result of the visitation), applied to King Edward IV. for means to arrest Prior Dyxwell, forasmuch as, like another son of perdition, he goes about from place to place, from town to town, and from market to market, more like a vagabond and an apostate than a regular monk, and causing in his travels the greatest scandal as well to the order as to religion in general. In the following year Dyxwell was deposed, and John Peyton took his place; but in 1465 Dyxwell was reappointed prior, and seven years later he received the appointment for life. We now approach the time of the dissolution. In 1535 certain visitors were appointed by Henry VIII., who probably visited the Norfolk religious houses in the early spring of the following year. Of Binham they reported that three of the brethren had been guilty of immorality. The priory was suppressed, and the reversion of the site and chief possessions were granted, in the 31st year of Henry VIII., to Thomas Paston, the fifth son of Sir William Paston, and a fresh grant to the same person was also made two years later. There is but one other circumstance to which it is desirable to refer. Sir Henry Spelman relates that Mr. Edward Paston, the son and heir of Thomas Paston, the grantee, being desirous to build a mansion-house upon or near the priory, attempted to clear some of the ground for the purpose, but a piece of wall fell upon a workman and slew him. Perplexed by this accident, he gave the work up entirely and built a house at Appleton instead.

—The day's journeyings wound up with a visit to Holkham Hall, over which, in the absence of the Earl and Countess of Leicester, the party were conducted by Mr. Napier of Holkham. The hall hardly comes within the scope of an archæological visit, but nevertheless it contains much of antiquarian interest, and particularly so in its large and extremely valuable library. The monastic manuscripts came in for a great share of attention. The members, on returning to Wells, dined at the Crown Hotel, where most of them stayed the night in preparation for a further round of visits on the following day, which was devoted to what may be comprehensively called the Nelson country, for it included visits to four of the Burnhams —Overy, Norton, Thorpe, and Market, and also to North and South Creake. Starting from the Crown Hotel the members drove to the church of Burnham Overy, which is situated on a commanding eminence. It was originally cruciform, but now consists only of nave, south aisle, porch, chancel, and low square tower, which last-named rises between chancel and nave, a very unusual feature in Norfolk. On the north wall of the church is a painting of St. Christopher. The Rector, in a short address, said the church was originally a connection of the Priory of Walsingham. The transepts were removed a hundred years ago because the tower seemed weak, and it was thought wise to reduce the height of it, and prop up the fabric with buttresses. The consequences had been very

curious as regards the services of the church. It was now necessary to have all of them, including the Communion service, in the nave, there being no money with which to open the chancel into the nave, as he desired to do. There was no doubt that the whole building was open from one end to the other up to the end of last century, so that there should be no difficulty in opening it again under the advice of a competent architect.—Burnham Norton Priory was next visited. The remains are not very extensive, the principal feature in them being a fine western gateway. According to a paper read by Mr. Bolingbroke, a house of White Friars was founded here about the year 1241 by Sir Ralph de Hemenhale and Sir William de Calthorp. Its principal benefactors were Bishop Walter Suffield *alias* Calthorpe in 1256, Sir Walter de Calthorpe in 1294, and Henry Fermor, Esq., in 1532. It was a foundation of some importance, and in 1486 a provincial chapter of the Carmelite Order was held here. It possessed sixty-eight acres of land altogether. Within the church was an altar to the Virgin, to whom the convent was dedicated. The site was granted in 1541 to William Lord Cobham, and is now the property of Lord Orford,.who states that the late lord caused excavations to be made some years ago, when some skeletons were unearthed.—A very short drive took the party to Burnham Norton Church. Here, by a curious innovation, the aisles have been screened off from the nave, for the reason that the parishioners are not numerous enough to fill aisles and nave as well. The chancel screen shows vestiges of painting, one of which is said to portray John Groom and his wife, by whom the screen was erected in 1458. Quite a unique interest attaches to a pulpit of 1450. Two of its panels bear the portraits of John Goldalle and Katherine Goldalle, his wife; the other panels portray various saints. The colours are very bright, but this, the rector explained, is due to his predecessor's niece, who, with a religious zeal not tempered with wisdom, touched up the original tints. The chancel was originally a bay, but as to when and why it disappeared evidence is not forthcoming. A curious and puzzling feature about the church is that the pillar of the last arch on the north side of the nave falls outside the west wall.—Visits were also paid to the churches of Burnham Ulph and Burnham Market, neither of which present any noteworthy features of antiquarian interest.—Luncheon took place at the Hoste Arms, Burnham Market. Dr. Bensly presided, and at the close votes of thanks were passed. The labours of Mr. Leonard Bolingbroke, the hon. secretary, and of Mr. Quinton, the assistant secretary, were heartily acknowledged.—On the way to the Creakes a flying visit was paid to the church of Burnham Thorpe, known all the world over as that of which Lord Nelson's father was rector.—At Creake Abbey the Rev. H. A. Wansbrough read a paper. A great part of the abbey walls still remain, the choir of the church being easily distinguishable. Several of the arches and pillars are in good preservation. The establishment was founded about 1206 by Sir Robert de Narford and Alice, his wife.—By far the most interesting feature in the afternoon's excursion was a visit to the handsome church of North Creake, where, in the absence of the rector, the Bishop of Thetford, the Rev. G. D'Angibau delivered an explanatory address. The nave is of four bays, and has a fine, open-timbered roof, lighted by windows of the Perpendicular period. The chancel, dating from 1301, is in the Decorated style, and has a beautiful east window of five lights. Piscina and sedilia still remain. On the floor is a fine brass, supposed to represent Sir W. Calthorp, lord of the manor in the fifteenth century, bearing in his hands a model of the church which he restored. Mr. D'Angibau said that, as a boy, Bishop Pearson certainly lived in North Creake, his father being rector of the parish about 1636. The most interesting feature in the church is the sacristy, from which rises one of the original old smoke turrets. The opinion has been expressed that the font dates back to the twelfth century. The register dates back to 1538.

Reviews and Notices of New Books.

[*Publishers are requested to be so good as always to mark clearly the prices of books sent for review, as these notices are intended to be a practical aid to book-buying readers.*]

LIFE IN EARLY BRITAIN. By Bertram C. A. Windle. Cloth, 8vo., pp. viii, 214. London: *D. Nutt.* Price 3s. 6d.

This is a thoroughly useful little book, and one which, to use a common expression, "supplies a felt want." There is no trustworthy, simple handbook of the kind, and Mr. Windle is to be warmly congratulated on the production of the present volume. It is a very unpretentious book, but none the less on that account an excellent one; and as it is copiously illustrated with excellent maps, plans, and accurate pictures, it is the more easy for the beginner to follow and understand. There are necessarily in a small book of this kind statements made which have been disputed, and are matters of controversy. We think the author would have done well to say so, and to indicate that the theory of the "Great Ice Age," for instance, is not universally accepted at the present day. Mr. Windle states that the subject matter of its pages was originally arranged for a course of lectures at Mason College, Birmingham, and that the object was to give a brief but clear account of the different races which inhabited this country in prehistoric and early historic times, and to describe the chief relics which each has left behind it, so that the book might serve as an introduction to the larger works of Sir John Evans, Professor Boyd Dawkins, and others. It is divided into eleven chapters, which deal with the different subjects as follows:

I. A General Historical Sketch; II. Palæolithic Man; III. Neolithic Man; IV. and V. The Bronze Period; VI., VII. and VIII. The Roman Occupation of Britain; IX. The Saxon Occupation; X. Tribal and Village Communities; XI. Some Traces of the Past Races of Britain.

The plan of the book and its execution are alike excellent, and we very cordially recommend it as a most useful introduction to the study of the early history of Britain.

THE ANCIENT STONE IMPLEMENTS, WEAPONS, AND ORNAMENTS OF GREAT BRITAIN. Second edition, revised. By Sir John Evans, K.C.B. Pp. xviii, 747. Cloth, 8vo. London: *Longmans*. Price 28s.

It is scarcely necessary to do more than note the fact that a new edition of Sir John Evans's work on "The Ancient Stone Implements of Great Britain" has been published. The original work, which appeared in 1872, has long been out of print, and, indeed, somewhat difficult to procure, so that the new edition will be very generally welcomed by the student of prehistoric archæology. So many new discoveries have been made since the work first appeared, that the second edition is in some senses a new book; but nothing that has been found has tended in the least degree to call for any modification in the plan of the book. What has been done is explained by Sir John Evans in the preface. He says: "In revising the work, it appeared desirable to retain as much of the original text and arrangement as possible; but having regard to the large amount of new matter that had to be incorporated in it, and to the necessity of keeping the bulk of the volume within moderate bounds, some condensation seemed absolutely compulsory. This I have effected, partly by omitting some of the detailed measurements of the specimens, and partly by printing a larger proportion of the text in small type. I have also omitted several passages relating to discoveries in the caverns of the South of France." He adds: "I have throughout preserved the original numbering of the figures, so that references that have already been made to them in other works will still hold good. The new cuts, upwards of sixty in number, that have been added in this edition, are distinguished by letters affixed to the number of the figure immediately preceding them."

These extracts from the preface to the new edition will give a sufficiently clear idea of the character of the changes which it has been found necessary to make in a work which has attained a world-wide reputation, and the production of which has long been recognised as an honour to English archæology. More it is needless to say in the brief space at our disposal. The work has been largely expanded, and that expansion has necessitated a corresponding amount of compression, and some omissions, but in other respects the book remains what it was. A special word of praise ought to be given to the index, which, without being needlessly overcharged with references, is unusually full and complete, giving every necessary reference. For this the reader is indebted to the author's sister, Mrs. Hubbard. When it is said that the index extends from p. 711 to the end of the book, it will be understood of how complete a character it is, and in such a work as this an intelligent index is an absolute necessity.

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LETTERS, ARCHÆOLOGICAL AND HISTORICAL, RELATING TO THE ISLE OF WIGHT. By the late Rev. E. Boucher James. Two vols., cloth, 8vo., pp. xv, 684, and pp. vii, 713. London: *Frowde*. Price 24s. net.

Books of essays on local archæology do not, as a rule, commend themselves to the antiquary, but in the case of the volumes before us the final verdict which the reader will pronounce on putting them down after studying their contents is that the *Isle of Wight County Press* was singularly fortunate in obtaining such a contributor to its columns as the late Mr. Boucher James. Mr. James was one of that class of clergymen, never a large one, and one which we fear is becoming more and more scarce, whose scholarly habits were not forgotten or blunted amid the cares and anxieties of a parochial charge. Although none of the essays in the work before us are exactly the result of direct investigation on the part of the author, they are none the less useful and valuable contributions to the history and archæology of the Isle of Wight. They are pleasantly written with scholarly precision and careful accuracy, and are likely more than almost anything else to stimulate a general spirit of intelligent interest in the past history of the island. There is, too, what we may describe as a very pleasing kindliness of tone running through the essays, which is especially noticeable in those dealing with ecclesiastical matters. In these a studied endeavour to hurt no person's feelings is very manifest. All manner of subjects dealing with the past are included in these essays, and it would be difficult to say which are the best where all is good, and so very far above the ordinary level. Mrs. James has been well advised in re-publishing these letters and essays, of which it is almost impossible to speak too highly. To residents in the Isle of Wight, and others connected with it, these volumes will be especially welcome. We have never known local history or archæology better or more intelligently discussed than it is by Mr. James in these letters, which should form an admirable model for others elsewhere in time to come. We can well understand that those who read the essays as they appeared would wish to see them preserved in a permanent form, and we feel sure that they will be grateful to Mrs. James and those who have assisted her in doing this. Well would it be for the provincial press of England if all local newspapers could obtain literary contributions on the history of their particular districts of the same high order of accuracy and literary merit as those which Mr. James sent to the *Isle of Wight County Press!*

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PREHISTORIC PROBLEMS. By Robert Munro, M.D., F.R.S.E. Cloth, 8vo., pp. xiv, 371. Edinburgh: *William Blackwood and Sons*. Price 10s. net.

In this volume, which is mainly composed of a number of papers which Dr. Munro either read before various meetings of societies or contributed to archæological papers, and which have since been brought down to date, the author discusses certain unsolved enigmas relating to prehistoric archæology.

The first part of the volume is anthropological rather than archæological, but the two sciences are so closely allied in many particulars that this division is almost more artificial than real. In the anthropological section of the book the rise and progress of anthropology, the relation between the erect posture and the physical and intellectual development of man, Dr. Dubois's fossil remains in Java, and the intermediary links between man and the lower animals, are dealt with.

In the second portion of the volume prehistoric trepanning (which Dr. Munro was the first to draw

attention to in this country), bone skates, and prehistoric saws and sickles, come in for their share of attention. The chapter, however, which contains most that will be new to antiquaries generally is that which deals with certain strange wooden objects, which have been found of late years in peat earth and bogs in various parts of Western Europe, and which have been thought to be traps for catching otters or beavers. Whether this is the true explanation of these puzzling objects must be left for further investigation. It does not also seem conclusive to us that they are necessarily of what is generally understood by prehistoric date. Their real age seems almost as doubtful as their use, and, as ten years have not yet elapsed since attention was first drawn to them, more conclusive evidence as to their character and age may be looked for in the future. When Dr. Munro first called attention to these objects in a paper communicated, in January, 1891, to the Society of Antiquaries of Scotland, he could only find evidence of eleven of them, whereas at the time when the work before us was prepared for the press, thirty-five had turned up. That gives an average of four discovered each year in the interval. Hence we may reasonably hope for the discovery of others which may tend to solve the puzzle they at present afford. Hitherto these machines have been found in such widely separate parts as Wales, Ireland, Germany, and Italy, but nowhere else. Probably, as time goes on, the area of their distribution will be found to be wider even than this, and something definite will be learnt as to their date and real use, so that when Dr. Munro next writes on them it will not have to be in a work dealing with "Problems."

The whole of the book is full of material for thoughtful and fascinating speculation. Dr. Munro is one of the few original investigators who possess the happy knack of presenting the results of their inquiries in a popular form. Problems of all kinds always have a fascination about them, and *Prehistoric Problems* by Dr. Munro are no exception to the rule. The author has given us a learned and useful work, and withal a very readable one. The different objects described are carefully illustrated.

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THE CLAN DONALD. By the Rev. A. MacDonald, Minister of Killearnan, and the Rev. A. Macdonald, Minister of Kiltarlity. Vol. I. Cloth, crown 8vo., pp. xxviii, 570. Inverness: *The Northern Counties Publishing Company.*

A great portion of the history of Scotland is that of its clans, and, *vice versâ*, the history of the clans is in a measure the story of the nation itself. On that account a careful investigation into the history of an important clan like that of the Clan Donald ought to throw much valuable light on Scottish history generally during the Middle Ages, and this the elaborate work before us undoubtedly does in a very useful manner. It would seem from the preface to this volume that a Clan Donald Society is in existence, and that the work before us is the first of three volumes to be issued under its direction dealing with the history of the clan.

It is impossible, in the limited space at our disposal, to review at all in detail the numerous statements contained in a portly volume of more than 550 pages, many of which statements are of a controversial nature, and so open to dispute. The editors have, however, evidently set to work with painstaking care and diligence, but they are at a disadvantage in living in the extreme North, removed from that ready access to original documentary evidence which is indispensable in such a work as that which they have undertaken. They dispute, and perhaps justly, Dr. Skene's theory as to the origin of the clan, but many of the statements in the book are undoubtedly open to question. This is especially the case in the last chapter, on the Church and Education, which is one of the most interesting in the volume. The authors evidently mean to be perfectly impartial, but no one could read the chapter without detecting that it is written from a modern Presbyterian standpoint. This, in a matter of history, is not exactly as it should be. The chapter in question is a very interesting historical essay, but it could never have been written by any but a Presbyterian. In the same way the secular history seems in places to be unconsciously made to fit in with preconceived theories. The book, however, as a whole, bears evidence of much labour, thought, and care, as well as an honest endeavour to be accurate and impartial. Its contents may be briefly indicated by the titles of the chapters into which it is divided, and which are as follow: Chapter I. Introductory; II. Descent of the Clan Donald; III. Somerled Macgillebride, 1100-1164; IV. The Descendants of Somerled; V. Bruce and the Clan Cholla, 1284-1329; VI. The Good John of Isla, 1330-1386; VII. Donald of Harlaw; VIII. Alexander de Ile, Earl of Ross, 1425-1449; IX. John de Ile, Earl of Ross; X. Decline and Fall of the House of Isla, 1462-1498; XI. The Clan Donald under James IV., 1493-1519; XII. The Clan Donald under James V., 1519-1545; XIII. Social History; XIV. The Church and Education. There are several illustrations of varying degrees of merit. We should like to suggest that in the present day photography is a much better method of reproducing facsimiles of documents than tinted lithography, useful as the latter was in days when photography and photozincography, with their later developments, were unknown.

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